TABLE OF CONTENTS FOR VOLUME 11

January–December 1957

Category	Abstract
	Each number below indicates the first of a group of entries, not a single entry.
GENERAL	1, 821, 1390, 1717, 2231, 2773, 3266, 3643, 4217, 4778, 5125, 5712, 6185, 6593, 7040, 7905, 8759, 9186, 9575, 9904, 10387, 11013, 11555, 11830, 12634, 13224, 13564
Atomic Bombs and Warfare	2773, 3643, 4217, 4778, 5125, 6593, 7040, 7905, 9905, 11013, 11830
Atomic Power	2, 821, 1390, 1717, 2231, 2773, 3266, 3646, 4219, 4779, 5126, 5712, 6185, 6594, 7043, 8759, 9907, 10387, 11014, 11832, 13224
Research Programs	12, 824, 1719, 3272, 7045, 7906, 8760, 9187, 10390, 11016, 11555, 11838, 12634
BIOLOGY AND MEDICINE	16, 826, 1392, 1720, 2233, 2776, 3274, 3648, 4221, 4780, 5128, 5713, 6190, 6595, 7046, 7398, 7907, 8257, 8761, 9190, 9576, 9912, 10391, 10803, 11017, 11556, 11840, 12313, 12635, 12959, 13227, 13565
Aerosols	4780, 5714, 10804, 11018, 13228
Radiation Effects	18, 828, 1392, 1723, 2234, 2777, 3274, 3648, 4224, 4781, 5132, 5715, 6193, 6596, 7048, 7908, 8762, 9192, 9915, 10394, 11019, 11557, 11840, 12639, 13229, 13565
Radiation Hazards and Protection	46, 876, 1402, 1747, 2238, 2796, 3295, 3668, 4246, 4795, 5171, 5731, 6208, 6612, 7065, 7399, 7918, 8260, 8789, 9201, 9577, 9947, 10409, 10805, 11035, 11558, 11876, 12313, 12649, 12962, 13246, 13567
Radiation Sickness	886, 2800, 3311, 3670, 5177, 6621, 7077, 8805, 9967, 10417
Radiography	57, 890, 7078, 7925
Radiotherapy	59, 891, 1758, 2802, 3315, 3672, 4258, 4798, 5178, 6216, 6622, 7079, 8806, 9970, 10418, 11890, 12655, 13251
Toxicology Studies	64, 892, 1405, 1759, 2244, 2804, 4260, 4802, 5179, 5746, 6222, 7082, 8261, 8813, 9975, 10422, 11047, 12656, 13252
Tracer Applications	66, 896, 1406, 1761, 2807, 3321, 3674, 4261, 4804, 5180, 5747, 6223, 6627, 7083, 7926, 8815, 9207, 9976, 10423, 11048, 11903, 12660, 13255, 13572
Waste Disposal	903, 2246
CHEMISTRY	73, 904, 1413, 1764, 2247, 2813, 3324, 3681, 4264, 4810, 5184, 5755, 6229, 6631, 7087, 7401, 7930, 8262, 8819, 9210, 9578, 9980, 10427, 10807, 11050, 11561, 11911, 12316, 12662, 12963, 13257, 13573
Aerosols	1771, 2255, 3689, 7942, 8837, 9223, 11077, 13263
Analytical Procedures	103, 921, 1426, 1772, 2256, 2824, 3336, 3690, 4280, 4820, 5206, 5773, 6249, 6654, 7107, 7433, 7943, 8290, 8839, 9224, 9592, 9996, 10441, 10815, 11078, 11579, 11929, 12343, 12673, 12972, 13265, 13603
Atomic Weights and Periodic Systems	4316, 11096
Crystallography and Crystal Structure	128, 945, 1451, 1781, 2842, 3709, 4831, 5222, 5798, 6267, 7955, 8299, 9237, 10005, 10450, 12975
Deuterium and Deuterium Compounds	132, 947, 1453, 1788, 2284, 3346, 3715, 4832, 5224, 6268, 6660, 8849, 9238, 10009, 11097, 11947, 12680
Fluorine and Fluorine Compounds	142, 949, 1455, 1794, 2286, 2844, 3349, 3720, 4317, 4833, 5229, 5799, 6270, 6661, 7120, 7442, 7956, 8301, 8850, 9240, 10011, 10455, 11100, 11588, 11948, 12681, 12976, 13278, 13609
Graphite	153, 952, 1456, 1795, 2291, 3352, 3727, 4321, 4836, 5233, 5801, 6271, 6662, 7123, 7445, 7957, 8305, 9245, 9601, 10013, 10458, 11101, 11590, 11950, 12353, 12685, 12979, 13279, 13616
Laboratories and Equipment	163, 1458, 1798, 2293, 3353, 3735, 4324, 4837, 5236, 5804, 6273, 6663, 7126, 7451, 7960, 8315, 8855, 9246, 9606, 10016, 10459, 11102, 12354, 13281, 13621
Molecular Structure	164, 955, 1460, 2845, 3356, 3739, 4331, 6668, 10017, 10460, 12687
Radiation Chemistry	166, 959, 1462, 1799, 2298, 2847, 3743, 4332, 5240, 5805, 6276, 6669, 7128, 7455, 8318, 8857, 9247, 10023, 10461, 11952, 12688, 13282, 13623
Radiation Effects	169, 963, 1467, 1804, 2299, 3357, 3744, 4345, 4839, 5244, 5808, 6280, 6674, 7130, 7458, 7961, 8319, 8857, 9609, 10028, 10464, 10818, 11105, 11956, 12691, 12983, 13283, 13625
Rare Earths and Rare-earth Compounds	174, 968, 1468, 1808, 2851, 3746, 4352, 4840, 5248, 5815, 6286, 7134, 7460, 7964, 8863, 9250, 10030, 10466, 11111, 11966, 12356, 13286, 13631

Category	Abstract
CHEMISTRY	
Separation Procedures	176, 975, 1475, 1809, 2302, 2854, 3359, 3747, 4354, 4841, 5250, 5817, 6291, 6679, 7135, 7461, 7965, 8322, 8864, 9253, 9613, 10033, 10469, 10820, 11119, 11593, 11967, 12357, 12698, 12986, 13288, 13632
Sorption Phenomena	204, 1008, 2364, 3766, 4373, 5277, 7150, 7976, 10040, 10837, 11129, 11989
Spectroscopy	205, 1490, 2872, 5278, 6306, 6691, 10041, 10485, 11992, 12711, 13298
Syntheses	207, 1011, 1491, 1835, 2875, 3368, 3768, 4378, 7152, 7561, 7977, 8399, 9668, 10042, 11132, 11650, 12712
Tracer Applications	210, 1013, 2877, 5279, 10046, 10487, 11993
Transuranic Elements and Compounds	211, 1014, 1836, 2366, 3371, 3769, 4382, 5280, 5823, 6308, 6693, 7153, 7562, 8400, 9266, 10489, 10838, 11134, 11997, 12413, 12713, 13024, 13684
Tritium and Tritium Compounds	1016, 11998, 13301, 13687
Uranium and Uranium Compounds	212, 1017, 1493, 1837, 2368, 2878, 3372, 3774, 4390, 4845, 5282, 5824, 6309, 6694, 7155, 7564, 8403, 8884, 9267, 9670, 10047, 10495, 10841, 11140, 11651, 11999, 12415, 12715, 13025, 13302, 13688
Waste Disposal	225, 1026, 1497, 1841, 2407, 3375, 3778, 4398, 5291, 5826, 6317, 6698, 7159, 7590, 8430, 8838, 10508, 10859, 11147, 11666, 12005, 12440, 12717, 13043, 13305, 13708
ENGINEERING	226, 1027, 1499, 1845, 2414, 2884, 3378, 3780, 4401, 4846, 5293, 5830, 6320, 6700, 7161, 7597, 7979, 8436, 8890, 9276, 9701, 10054, 10510, 10860, 11150, 11668, 12008, 12442, 12720, 13045, 13306, 13709
Aerosols	1029, 6322
Heat Transfer and Fluid Flow	230, 1031, 1501, 1846, 2424, 2887, 3381, 3786, 4410, 4848, 5297, 5833, 6323, 6703, 7162, 7597, 8436, 8892, 9276, 9703, 10054, 10513, 10862, 11159, 11669, 12011, 12443, 12721, 13046, 13307, 13709
Materials Testing	253, 1047, 1505, 1856, 2443, 2891, 3385, 3796, 4417, 4850, 5302, 5845, 6340, 6710, 7169, 7981, 8440, 8900, 9282, 9707, 10065, 10517, 11170, 11670, 12016, 12447, 12723, 13049, 13314, 13723
Pumps	1057, 2458, 2894, 3800, 4422, 5304, 5848, 6345, 7170, 7599, 7982, 9708, 10066, 10866, 11174, 12021, 12449, 12725, 13316
Radiography	256, 1062, 5850, 7172, 10071, 10521, 12452
Tracer Applications	1508, 3802, 7173, 8904, 13318
Vacuum Systems	1509, 2468, 12022
Waste Disposal	257, 2469, 3803, 4423, 5851, 6711, 7983, 8441, 9283, 10867, 11175, 11672, 12023, 12453, 13731
MINERALOGY, METALLURGY, AND CERAMICS	258, 1064, 1512, 1857, 2474, 2896, 3387, 3804, 4425, 4854, 5306, 5853, 6347, 6713, 7175, 7600, 7984, 8442, 8908, 9284, 9713, 10072, 10523, 10869, 11176, 11673, 12024, 12455, 12726, 13052, 13320, 13733
Ceramics and Refractories	259, 1064, 1513, 1857, 2474, 2896, 3387, 3804, 4425, 4854, 5307, 5855, 6347, 6713, 7175, 7600, 7984, 8442, 8908, 9284, 9713, 10073, 10523, 10869, 11178, 11673, 12024, 12457, 12726, 13320, 13734
Corrosion	268, 1072, 1517, 1862, 2478, 2898, 3393, 3806, 4429, 4860, 5308, 5859, 6348, 6717, 7183, 7602, 7990, 8443, 8911, 9285, 9715, 10078, 10528, 10872, 11183, 11674, 12026, 12458, 12730, 13052, 13321, 13740
Geology and Mineralogy	283, 1081, 1871, 2906, 3402, 3819, 4433, 4861, 5315, 5863, 6353, 6723, 7190, 7622, 7996, 8913, 9291, 9726, 10083, 10539, 11188, 12036, 12734, 13327
Metals and Metallurgy	300, 1119, 1520, 1873, 2490, 2912, 3412, 3831, 4446, 4872, 5325, 5871, 6362, 6733, 7193, 7622, 8002, 8461, 8916, 9322, 9727, 10088, 10549, 10883, 11193, 11687, 12047, 12468, 12737, 13058, 13331, 13763
Tracer Applications	8939, 10583, 12755, 13351
PHYSICS	383, 1175, 1541, 1920, 2539, 2935, 3438, 3873, 4484, 4899, 5363, 5910, 6414, 6746, 7210, 7690, 8024, 8541, 8941, 9343, 9752, 10105, 10584, 10903, 11242, 11727, 12068, 12503, 12756, 13106, 13353, 13825
Aerosols	395, 1929, 2553, 2944, 3445, 3885, 4502, 5378, 5917, 7223, 8037, 8947, 10122
Astrophysics	1196, 1545, 1930, 3887, 4503, 5379, 8040, 8948, 11273
Cosmic Radiation	396, 1197, 1546, 1931, 2945, 3446, 3890, 4504, 4907, 5380, 5918, 6428, 6762, 7224, 8041, 8949, 9355, 10124, 10596, 11277, 12088, 12770, 13363
Crystallography and Crystal Structure	411, 1201, 1551, 2554, 2954, 4512, 4912, 5384, 5928, 6430, 6770, 7225, 8044, 8958, 9360, 9759, 10133, 10599, 11279, 12093, 12777, 13367
Electrical Discharge	419, 1554, 1941, 2558, 3453, 3899, 4515, 4913, 5390, 5933, 6433, 6771, 7227, 8047, 8550, 8960, 9364, 10135, 10603, 11283, 12098, 12779, 13370, 13840
Electrons	436, 1208, 1556, 1946, 3454, 3901, 4523, 4914, 5398, 5936, 6776, 7235, 8065, 8964, 9368, 10142, 10608, 11291, 12103, 12783, 13372
Gases	443, 1212, 1956, 2559, 2956, 3459, 3902, 4525, 4916, 5402, 5938, 6778, 7237, 8068, 8969, 9370, 10145, 10611, 10904, 11292, 12105, 12788, 13374
Instruments	448, 1219, 1558, 1962, 2561, 2961, 3463, 3904, 4531, 4917, 5408, 5940, 6434, 6779, 7240, 7696, 8069, 8551, 8972, 9371, 9760, 10146, 10614, 11296, 11732, 12107, 12512, 12791, 13377, 13841

Category	Abstract
PHYSICS	
Isotopes	469, 1226, 1567, 1972, 2580, 2968, 3473, 3933, 4552, 4925, 5419, 5949, 6449, 6794, 7252, 8554, 8981, 9376, 9762, 10155, 10622, 10905, 11305, 12125, 12798
Isotope Separation	1229, 1568, 2581, 3940, 4558, 5421, 5955, 6452, 6797, 7254, 7701, 8555, 8986, 9378, 9763, 10158, 11733, 12127, 12513, 12799, 13108, 13843
Mass Spectrography	1230, 1570, 2584, 2970, 3943, 4559, 5426, 5956, 6454, 7255, 7706, 8077, 8990, 9380, 10159, 10630, 10907, 11313, 11734, 12129, 12514, 12800, 13383, 13847
Mathematics	476, 1231, 1575, 1976, 2585, 2971, 3475, 3944, 4560, 4930, 5427, 5957, 6455, 6798, 7257, 8079, 8558, 8990, 9383, 10160, 10631, 10908, 11315, 11736, 12133, 12802, 13110, 13384, 13850
Measuring Instruments and Techniques	481, 1238, 1579, 1979, 2596, 2974, 3476, 3946, 4564, 4933, 5436, 5961, 6466, 6814, 7263, 8082, 8995, 9397, 9765, 10171, 10646, 10909, 11321, 11737, 12139, 12515, 12807, 13111, 13387, 13852
Mesons	521, 1258, 1609, 1999, 2993, 3499, 3977, 4594, 4950, 5465, 5982, 6483, 6843, 7282, 8100, 9027, 9410, 10196, 10664, 11334, 12161, 12817, 13396
Meteorology	1263, 2615, 3504, 4955, 6000, 6488, 9042, 12838, 13413
Microwaves	4603, 6854, 11346, 12177
Molecular Properties	538, 2017, 3004, 4003, 4604, 6002, 6855, 8109, 9043, 9429, 10225, 13414
Neutrons	541, 1265, 1616, 2018, 2616, 3005, 3505, 4006, 4606, 4956, 5488, 6005, 6489, 6856, 7285, 8110, 8562, 9045, 9430, 9766, 10228, 10683, 10910, 11347, 12181, 12840, 13112, 13425, 13853
Nuclear Physics	548, 1272, 1618, 2026, 3007, 3509, 4011, 4612, 4957, 5493, 6010, 6492, 6863, 7291, 7707, 8116, 8566, 9051, 9437, 9770, 10231, 10685, 11348, 11739, 12186, 12518, 12843, 13113, 13430, 13855
Nuclear Properties	592, 1287, 1635, 2058, 2620, 3027, 3523, 4033, 4629, 4973, 5531, 6035, 6507, 6875, 7309, 7712, 8137, 8569, 9068, 9440, 9774, 10244, 10697, 10916, 11357, 12194, 12519, 12852, 13115, 13443, 13857
Nuclear Reactors	628, 1311, 1655, 2097, 2630, 3062, 3543, 4069, 4654, 5004, 5562, 6068, 6520, 6883, 7320, 7716, 8163, 8575, 9089, 9463, 9779, 10272, 10714, 10921, 11389, 11741, 12210, 12520, 12869, 13118, 13486, 13860
Nuclear Transformation	684, 1344, 1671, 2144, 2737, 3085, 3577, 4113, 4706, 5040, 5619, 6108, 6545, 6932, 7336, 7866, 8190, 8722, 9138, 9488, 10319, 10756, 11446, 12268, 12908, 13191, 13518
Particle Accelerators	716, 1354, 1674, 2156, 2743, 3102, 3586, 4135, 4721, 5051, 5632, 6127, 6554, 6940, 7341, 7867, 8199, 8727, 9145, 9497, 9879, 10327, 10767, 10995, 11456, 11816, 12279, 12616, 12916, 13192, 13524, 14017
Radiation Absorptioning and Scattering	734, 1363, 1676, 2159, 2748, 3186, 3592, 4144, 4727, 5055, 5647, 6132, 6556, 6944, 7347, 8202, 8736, 9150, 9501, 10334, 10770, 11000, 11460, 12284, 12921, 13198, 13532, 14024
Radiation Effects	761, 1370, 1691, 2180, 2754, 3203, 3596, 4160, 4738, 5066, 5667, 6148, 6565, 6958, 7357, 7882, 8215, 8737, 9156, 9506, 9889, 10353, 10729, 11002, 11467, 11818, 12288, 12622, 12929, 13199, 13548, 14026
Radioactivity	768, 1377, 1693, 2190, 2758, 3207, 3660, 4169, 4746, 5069, 5670, 6155, 6569, 6963, 8218, 9161, 9508, 10355, 10783, 11481, 12292, 12933, 13211, 13551, 14032
Rare Earths and Rare-earth Compounds	787, 3212, 3617, 4178, 4748, 6572, 8227, 9168, 9518, 10359, 10784, 11484, 12297, 12941, 13552
Shielding	789, 1382, 1701, 2195, 2761, 3213, 3618, 4179, 4753, 5676, 6160, 6573, 6969, 7367, 7890, 8230, 8748, 9172, 9892, 10365, 11003, 11485, 11821, 12300, 12628, 12942, 13212, 13554, 14033
Spectroscopy	793, 1383, 1705, 2197, 3215, 3621, 4184, 4754, 5678, 6162, 6971, 7368, 8233, 9174, 9895, 10366, 10786, 11486, 11825, 12301, 12943, 13555, 14037
Theoretical Physics	802, 1385, 1706, 2202, 3623, 4188, 4759, 5072, 5681, 6168, 6575, 6975, 7374, 8237, 9177, 9521, 10372, 10790, 11487, 12305, 12945, 13556
Tracer Applications	2220, 9181, 10797
Tritium and Tritium Compounds	5701, 10385
Uranium and Uranium Compounds	811, 1388, 1709, 2221, 2769, 3217, 4212, 3631, 4761, 5079, 5702, 6182, 6580, 6991, 7382, 7892, 8246, 8751, 9182, 9525, 9897, 10386, 10798, 11005, 11489, 11826, 12309, 12630, 12953, 13221, 13561, 14038
PATENTS	1712, 3219, 3633, 4772, 5083, 5705, 6582, 6993, 7385, 8248, 9527, 11496
Biology	1712
Chemistry	3219, 3633, 5083, 5705, 6582, 6993, 7385, 8248, 9527, 11496
Engineering	1713, 3246, 3634, 5099, 6585, 7013, 7389, 9541, 11519
Mineralogy, Metallurgy and Ceramics	3247, 5100, 6587, 7015, 7391, 9542, 11520
Physics	1714, 3251, 3636, 4772, 5103, 5708, 6591, 7022, 7395, 8252, 9546, 11522

INDEXES FOR VOLUME 11

	Page
PERSONAL AUTHOR INDEX	1569
CORPORATE AUTHOR INDEX	1635
SUBJECT INDEX	1649
NUMERICAL INDEX OF REPORTS	2087
COMPREHENSIVE AND BASIC BOOKS SPONSORED BY THE AEC	2187

LIST OF PERIODICALS SCANNED FOR NSA

The periodicals listed below have been scanned for material to be abstracted in *NSA*. Continued re-evaluation of the productivity of the available journals has resulted in additions to and deletions from the list during the course of the year. A single asterisk (*) denotes titles added to the scanning list during the year, and a double asterisk (**) denotes titles removed from the list during the year. All other titles have been scanned throughout the year. The titles are arranged alphabetically with an underscore indicating that portion used as the abbreviation. A number of books, in English and other languages, and translations of single journal articles have been abstracted in addition to the items selected from these periodicals.

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Acta Crystallographica
Acta Metallurgica
*Acta Physica Academiae Scientiarum Hungaricae
Acta Physica Austriaca
Acta Radiologica
Advances in Physics
A.I.Ch.E Journal
American Ceramic Society Bulletin, The
American Industrial Hygiene Association Quarterly
American Journal of Physics
American Journal of Physiology, The
American Journal of Roentgenology, Radium Therapy and Nuclear Medicine, The
American Mineralogist, The
Anais da academia brasileira de ciencias
Anales de la real sociedad española de física y química (Madrid), Serie A
Anales de la real sociedad española de física y química (Madrid), Serie B
Analyst, The
Analytica Chimica Acta
Analytical Chemistry
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*Annals of Physics (N. Y.)
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*Applied Statistics
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Archives of Ophthalomology (Chicago)
Arkiv för Fysik
*Atombrief
Atomics and Nuclear Energy (Formerly Atomics, Engineering and Technology)
*Atomkern-Energie (Formerly Atomenergie)
*Atompraxis
*Atomwirtschaft, Die
Australian Journal of Applied Science
*Australian Journal of Chemistry
Australian Journal of Physics
*Berichte über die wissenschaftliche Biologie
Biochemical Journal
Biochemistry (USSR) (English Translation)
*Biophysics (USSR) (English Translation)
Botanicheskiĭ Zhurnal
British Journal of Applied Physics
British Journal of Haematology
British Journal of Radiology
*Bulletin of the Atmospheric Radioactivity (Japan)
Bulletin of the Chemical Society of Japan
Bulletin de la classe des sciences, Académie royale de Belgique
Bulletin of Experimental Biology and Medicine (USSR) (English Translation)
**Bulletin of the Geological Society of America
Bulletin of the Institute of Nuclear Science "Boris Kidrich" (Belgrade)
Bulletin of the Research Council of Israel, Section A
*Bulletin de la société chimique de France
Canadian Journal of Chemistry
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Cancer
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Comptes rendus hebdomadaires des séances de l'académie des sciences
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Doklady Akademii Nauk S.S.S.R.
Economic Geology and the Bulletin of the Society of Economic Geologist
Endocrinology
Energia nucleare (Milan)
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Experientia
Experimental Cell Research
Fiziologicheskiĭ Zhurnal S.S.S.R. imeni I. M. Sechenova
Genetics
Geochimica et Cosmochimica Acta
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Indian Journal of Physics and Proceedings of the Indian Association for the Cultivation of Science
Industrial and Engineering Chemistry
*Industrial Laboratories
*Industrie chimique belge, L'(De Belgische Chemische Industrie)
*Industries Atomiques
International Journal of Applied Radiation and Isotopes
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Iron Age
Izvestiya Akademii Nauk S.S.S.R., Otdelenie Khimicheskikh Nauk
Izvestiya Akademii Nauk S.S.S.R., Otdelenie Tekhnicheskikh Nauk
Izvestiya Akademii Nauk S.S.S.R., Seriya Biologicheskaya
Izvestiya Akademii Nauk S.S.S.R., Seriya Fizicheskaya
Izvestiya Akademii Nauk S.S.S.R., Seriya Geofizicheskaya
Izvestiya Akademii Nauk S.S.S.R., Seriya Geologicheskaya
Izvestiya Akademii Nauk S.S.S.R., Seriya Matematicheskaya
*"J. Stefan" Institute Reports (Ljubljana)
Journal of the American Ceramic Society
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Journal of Applied Mechanics
Journal of Applied Physics
Journal of Bacteriology
Journal belge de radiologie
Journal of Biological Chemistry, The
Journal of the British Nuclear Energy Conference
Journal of Cellular and Comparative Physiology
Journal of Chemical Physics, The
Journal of the Chemical Society (London)
Journal de chimie physique et de physico-chimie biologique
Journal of Clinical Endocrinology and Metabolism, The
Journal of Clinical Investigation, The
Journal of the Electrochemical Society
Journal of the Indian Chemical Society
Journal of the Indian Institute of Science
Journal of Inorganic & Nuclear Chemistry
Journal of the Institute of Metals with Bulletin and Metallurgical Abstracts
Journal of Laboratory and Clinical Medicine, The
Journal of Metals
*Journal of Microbiology, Epidemiology and Immunobiology (USSR) (English Translation)
*Journal of Molecular Spectroscopy
Journal of the National Cancer Institute
Journal of Nuclear Energy
Journal of the Optical Society of America

Journal of Physical Chemistry, The
Journal of the Physical Society of Japan
Journal de physique, Le, et Le radium
Journal of Research of the National Bureau of Standards
Journal of Scientific and Industrial Research (India), Sect. A
Journal of Scientific and Industrial Research (India), Sect. B & C
Journal of Scientific Instruments
*Journal of the Science of Food and Agriculture
Journal of the Scientific Research Institute (Tokyo)
*Journal of the Society for Non-Destructive Testing
Kolloidnyĭ Zhurnal
Kongelige Danske Videnskabernes Selskab, Det, Matematisk-fysiske Meddelelser
*Kongelige Danske Videnskabernes Selskab, Det, Matematisk-fysiske Skrifter
*Kongelige Norske Videnskabers Selskabs, Det, Forhandlinger
Matematicheskiĭ Sbornik
Medicamundi
Meditsinskaya Radiologiya
Metal Progress
Metallurgia
*Microchemical Journal
Mikrobiologiya
*Missiles and Rockets
Nature (London)
Naturwissenschaften
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*Nuclear Instruments
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Nuclear Science and Engineering
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*Powder Metallurgy Bulletin
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Priroda
*Problems of Hematology and Blood Transfusion (USSR) (English Translation)
*Problems of Oncology (USSR) (English Translation)
Proceedings of the Chemical Society (London)
Proceedings of the Indian Academy of Sciences, Section A
Proceedings of the National Academy of Sciences of the United States of America
Proceedings of the Physical Society (London), The, Section A
Proceedings of the Physical Society (London), The, Section B
Proceedings of the Society for Experimental Biology and Medicine
Proceedings of the Royal Society (London), Series A
Progress of Theoretical Physics (Kyoto)
*Publicaciones de la comisión nacional de energía atómica (Buenos Aires) Miscelanea
*Publicaciones de la comisión nacional de energía atómica (Buenos Aires) Serie fisica
*Publicaciones de la comisión nacional de energía atómica (Buenos Aires) Serie matematica
*Publicaciones de la comision nacional de energía atómica (Buenos Aires) Serie quimica
*Quarterly Review of Biology, The
Radiation Research
Radiology
R C N Bulletin (Reactor Centrum Nederland)
Research (London)
Review of Scientific Instruments, The
Reviews of Modern Physics
Revista mexicana de física
Revista mexicana de radiología
Science
*Scientific Proceedings of the Royal Dublin Society, The
*Sitzungsberichte der Gesellschaft zur Beförderung der gesamten Naturwissenschaften zu Marburg
Soviet Journal of Atomic Energy (English Translation)
*Soviet Physics (Doklady)
Soviet Physics JETP (An English translation of Zhur. Eksptl'. i Teoret. Fiz.)
*Spectrochimica Acta
Strahlentherapie
Transactions of the American Society of Mechanical Engineers
Transactions of the Faraday Society
Uspekhi Fizicheskikh Nauk
Uspekhi Khimii
Uspekhi Sovremennoĭ Biologii
Vestnik Akademii Nauk S.S.S.R.
Welding Journal, The (New York)
Zeitschrift für angewandte Physik
Zeitschrift für Naturforschung, Pt. a
Zeitschrift für Physik
Zhurnal Analiticheskoĭ Khimii
*Zhurnal Eksperimental'noĭ i Teoreticheskoĭ Fiziki
Zhurnal Fizicheskoĭ Khimii
Zhurnal Obshcheĭ Biologii
Zhurnal Obshcheĭ Khimii
Zhurnal Prikladnoĭ Khimii
Zhurnal Technicheskoĭ Fiziki
Zoologicheskiĭ Zhurnal

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Chemist Analyst
Chimia (Switzerland)
Croatica Chemica Acta
Giornale italiano di chemioterapia
Journal American Water Works Association
Journal of Fluid Mechanics
Journal of Mathematics and Physics
Machine Design
Mechanical Engineering
Modern Plastics
Österreichische Akademie der Wissenschaften, Mathematisch-naturwissenschaftliche Klasse, Anzeiger
Plant Engineering
Progress in Nuclear Energy
Public Health Reports (U. S.)
Transactions of the Bose Research Institute, Calcutta
Transactions of the Institution of Chemical Engineers (London)

Journal of Physical Chemistry, The
Journal of the Physical Society of Japan
Journal de physique, Le, et Le radium
Journal of Research of the National Bureau of Standards
Journal of Scientific and Industrial Research (India), Sect. A
Journal of Scientific and Industrial Research (India), Sect. B & C
Journal of Scientific Instruments
*Journal of the Science of Food and Agriculture
Journal of the Scientific Research Institute (Tokyo)
*Journal of the Society for Non-Destructive Testing
Kolloidnyĭ Zhurnal
Kongelige Danske Videnskabernes Selskab, Det, Matematisk-fysiske Meddelelser
*Kongelige Danske Videnskabernes Selskab, Det, Matematisk-fysiske Skrifter
*Kongelige Norske Videnskabers Selskabs, Det, Forhandlinger
Matematicheskiĭ Sbornik
Medicamundi
Meditsinskaya Radiologiya
Metal Progress
Metallurgia
*Microchemical Journal
Mikrobiologiya
*Missiles and Rockets
Nature (London)
Naturwissenschaften
Nuclear Engineering
*Nuclear Instruments
Nuclear Physics
Nuclear Power
Nuclear Science and Engineering
Nucleonics
Nuovo cimento (Including all supplements)
Oncologia
Philosophical Magazine, The
Physica
Physical Review, The
Physics and Chemistry of Solids, The
Physics in Medicine and Biology
*Powder Metallurgy Bulletin
Prikladnaya Matematika i Mekhanika
Priroda
*Problems of Hematology and Blood Transfusion (USSR) (English Translation)
*Problems of Oncology (USSR) (English Translation)
Proceedings of the Chemical Society (London)
Proceedings of the Indian Academy of Sciences, Section A
Proceedings of the National Academy of Sciences of the United States of America
Proceedings of the Physical Society (London), The, Section A
Proceedings of the Physical Society (London), The, Section B
Proceedings of the Society for Experimental Biology and Medicine
Proceedings of the Royal Society (London), Series A
Progress of Theoretical Physics (Kyoto)
*Publicaciones de la comisión nacional de energía atómica (Buenos Aires) Miscelanea
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Radiology
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Reviews of Modern Physics
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Revista mexicana de radiología
Science
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Uspekhi Khimii
Uspekhi Sovremennoĭ Biologii
Vestnik Akademii Nauk S.S.S.R.
Welding Journal, The (New York)
Zeitschrift für angewandte Physik
Zeitschrift für Naturforschung, Pt. a
Zeitschrift für Physik
Zhurnal Analiticheskoĭ Khimii
*Zhurnal Eksperimental'noĭ i Teoreticheskoĭ Fiziki
Zhurnal Fizicheskoĭ Khimii
Zhurnal Obshcheĭ Biologii
Zhurnal Obshcheĭ Khimii
Zhurnal Prikladnoĭ Khimii
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Progress in Nuclear Energy
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Transactions of the Institution of Chemical Engineers (London)

PERSONAL AUTHOR INDEX FOR VOLUME 11

For each reference the digits preceding the dash are the volume numbers and digits after the dash are the abstract numbers.

A

AANODT R L
11-10749
AANDERAA I
11-4924
AARONSON HUBERT I
11-4467
ABASHIAN A
11-1652 11-6022
11-13463
ABASHIDZE K A
11-5485
ABATIELLO A A
11-9541
ABBANAT R F
11-2490
ABBATT JOHN D
11-4788
ABBOTT ROBERT C
11-9270 11-9271
ABEE H H
11-1026
ABELE M
11-4754
ABELSON ROBERT J
11-13951
ABERNATHY F H
11-2748
ABERNETHY L L
11-4858
ABERS ALMA
11-9716
ABERS E K
11-10818
ABRAHAM B M
11-10314
ABRAHAM BERNARD M
11-8845
ABRAHAM M
11-6027 11-10263
ABRAHAMS A
11-1754
ABRAHAMS ALBERT P
11-5455
ABRAHAMSON S
11-844
ABRAMOVITZ STANLEY
11-1049
ABRAMS C S
11-5264 11-11595
ABRAMS CHARLES S
11-2352 11-2397
ABRAMS MARVIN J
11-10962
ABRIKOSOV A A
11-1950 11-1952
11-9427
ABRISS A
11-12718
ABSALOM R M
11-4658 11-7321
11-9465 11-10228
ABSHIRE ELEANOR
11-6736
ABSON W
11-5460
ACCINELLI JOHN B
11-1184
ACHARD JEAN-CLAUDE
11-10030
ACHARI RAHIM
11-9511
ACHBACH W P
11-10518 11-11208
ACHERMAN WALTER L
11-7185
ACHTER M R
11-2536
ACHTNER JOSEPH
11-11796
ACKERMAN LAUREN V
11-6206
ACKERMANN R J
11-6713
ACKERMANN RAYMOND J
11-2880
ACKROYD R T
11-3073 11-7327
ACOSTA ARISTEO
11-1399
ADAIR R K
11-6022
ADAM H W
11-2307
ADAM J
11-1145 11-5328
11-5819 11-6397
ADAMCHUK YU V
11-5558
ADAMS C H
11-81
ADAMS CLARA I
11-1012
ADAMS D D
11-13712
ADAMS E N
11-3014
ADAMS GEORGE B JR
11-5859 11-7183
11-8017 11-9980
ADAMS H K JR
11-11221
ADAMS J B
11-930 11-988
11-1356 11-5263
11-10037
ADAMS JOHN W
11-1118
ADAMS O W
11-3833
ADAMS R H
11-2377 11-12408
ADAMS R M
11-11599
ADAMS RICHARD M
11-151
ADAMSON A W
11-11619
ADAMSON ARTHUR W
11-916 11-7088
11-7420 11-8985
ADAMSON G M
11-308 11-1874
11-4678 11-4876
11-5010 11-11697
11-13898
ADAMSON G M JR
11-4464
ADAMSON GEORGE M
11-6092
ADDA Y
11-13562
ADDA YVES
11-1892 11-11230
11-11232
ADDISON C C
11-1025
ADELMAN F L
11-9773 11-9883
11-9903 11-13187
ADELMAN FRANK
11-8724
ADER M
11-10841
ADER MARIE
11-4172
ADES LEON
11-2902
ADITYA S K
11-1828
ADITYA SUKUMAR
11-10024
ADKINS GEORGE B
11-1
ADLAM J H
11-5945 11-6128
ADLER F T
11-2158
ADLER HANS H
11-4288
ADLER ISIDORE
11-11933
ADLER J
11-5064
ADLEY F E
11-2241 11-7174
ADO IU M
11-1947 11-12919
ADORNI M
11-5227
ADYASEVICH B P
11-710 11-711
AEBERHARDT A
11-3677 11-6470
AFRIKIAN L M
11-2057 11-4628
AFROSIMOV V V
11-3200 11-3201
AGARWAL BIPIN K
11-10774
AGEEV M V
11-9335
AGGARWAL P S
11-10134
AGGEN GEORGE
11-10581
AGLINTSEV K K
11-784 11-1998
AGNEW J T
11-13892
AGODI A
11-5620
AGRANOVSKAYA A I
11-264 11-10074
AGUILAR J
11-4728
AHANKAR JAGDISH
11-12001
AHERN W T
11-10862
AHIEZER A
11-427
AHMANN D H
11-7002 11-8490
AHMAVAARA Y
11-1619
AHNLUND KATARINA
11-6109 11-6145
AHRENS L H
11-2845 11-2846
11-4926 11-7998
11-11071
AHRLAND STEN
11-145 11-146
11-216
AIELLO W P
11-5054 11-10229
AIHARA EIKO
11-7314
AIKIN A M
11-5271
AILLOUD J
11-6439 11-6440
AINSCOUGH J B
11-6243
AIRAPETYANTS A V
11-6478 11-6479
AIREY L
11-4280 11-10033
AITIMURZAEV T
11-9281
AITKEN A H
11-10771
AITKEN K L
11-4983
AITKEN P B
11-3613
AIVAZIAN M T
11-1936
AIYAMA YOSHIMICHI
11-9352
AJZENBERG SELOVE F
11-1647 11-3012
AKELEY EDWARD S
11-3138 11-3142
11-3151 11-11253
AKERLIND LARS
11-6972
AKHIEZER A I
11-3900 11-8115
11-10239 11-11487
AKHIEZER N
11-8115
AKIMOV E M
11-3454
AKIN POLLY VANCE
11-8805
AKIN S W
11-7833
AKISHIN P A
11-126 11-1230
AKPINAR SAIT
11-10662
AKULOV N S
11-1144
ALBA A F
11-8804
ALBA A FERNANDO
11-4177
ALBAUGH F W
11-8368 11-11410
ALBAUM HARRY G
11-2788 11-10396
ALBEE HOWARD F
11-10543
ALBERS FRANK C
11-9217
ALBERT R D
11-2768
ALBERTS A H
11-13086
ALBERTY ROBERT A
11-7097
ALBITSKAIA E A
11-4127 11-6156
ALBRECHT W L
11-11120
ALBRECHT W M
11-5909 11-7939
11-12745
ALBRIGHT J C
11-9243
ALBURGER D E
11-4995
ALBURGER DAVID E
11-3973
ALCOCK K
11-221 11-2896
11-4357 11-4359
11-6303 11-6309
11-11115 11-13283
ALDER B J
11-6660
ALDER K
11-3521
ALDER KURT
11-3011 11-12937
ALEKSANDROV S N
11-7080
ALEKSANDROVA M F
11-853
ALEKSANIAN A S
11-1936
ALEKSEENKO N I
11-94
ALEKSEEV A I
11-5527
ALEKSEEV N G
11-10195
ALEKSEEVSKII N E
11-380
ALEKSEYEV A S
11-4495
ALESHIN B V
11-10426
ALEXANDER A L
11-10538
ALEXANDER C A
11-5230 11-5232
ALEXANDER G
11-5973
ALEXANDER L G
11-6892 11-7787
11-9096 11-9385
11-13913
ALEXANDER LLOYD G
11-6099 11-9810
11-9823 11-11000
ALEXANDER MARY L
11-6605
ALEXANDER P
11-966 11-11848
ALEXANDER P P
11-8751
ALEXANDER S
11-2581
ALEXANDRE EUGENE
11-3186
ALEXEFF I
11-6856
ALFORD W PARKER
11-4647
ALFREY G F
11-9361
ALFVEN HANNES
11-11353
ALGER R S
11-1805
ALIKHANOV S G
11-12801
ALIMARIN I P
11-200 11-1279
11-1830 11-9274
11-10484 11-10494
11-12713 11-13277
ALIMOV R Z
11-251
ALIVERTI G
11-3494 11-5749
ALKHAZOV D G
11-692 11-4067
11-8142
ALKIRE G J
11-10175 11-11326
11-11621
ALLAN D L
11-5626
ALLAN H R
11-1360 11-4715
ALLARD G A
11-13198
ALLARD JAMES G
11-9409
ALLARD R W
11-5130
ALLEN A L
11-8420 11-10845
11-11660
ALLEN A O
11-8737 11-9584
11-9612 11-13630
ALLEN A W
11-8366
ALLEN AUGUSTINE O
11-5805
ALLEN B C
11-11237
ALLEN C M
11-8576
ALLEN C MALCOLM
11-11750
ALLEN E S
11-3634
ALLEN H J
11-909
ALLEN HARRY C JR
11-13416

ALLEN J E
11-4520 11-5396
ALLEN J S
11-3916 11-11384
ALLEN J W
11-4464 11-4538
11-5847
ALLEN JOHN M
11-1501
ALLEN K R
11-8212 11-10168
ALLEN K W
11-1353
ALLEN OTIS W
11-5821
ALLEN P L
11-9210
ALLEN R A
11-4169
ALLEN R C
11-1683
ALLEN ROBERT C
11-6184
ALLEN ROBERT J
11-931
ALLEN W D
11-11387 11-13428
ALLEN-WILLIAMS D J
11-5127
ALLIS W P
11-444 11-2558
11-6772
ALLISON A G
11-13738
ALLISON ADRIAN G
11-7898 11-9713
ALLISON B A
11-697
ALLISON G M
11-1864
ALLISON M
11-7674
ALLISON SAMUEL K
11-1960
ALLISTON W H
11-6811
ALLRED V D
11-3805 11-8273
11-8274 11-8275
ALLSOPP C B
11-9001
ALLSOPP H J
11-1780
ALMOVIST E
11-5625 11-12857
ALPEN E L
11-3652 11-11024
ALPER TIKVAH
11-883
ALPERS V V
11-522 11-1258
11-3990 11-3998
11-6429
ALPERT MARSHALL B
11-11985
ALPHONCE R
11-6497
ALSTON M H
11-3199
ALSTON MARGARET H
11-1262 11-12824
ALTER H WARD
11-7453 11-7534
11-8868
ALTMAN MANFRED
11-7823
ALTMANN S L
11-7226
ALTON E
11-4381
ALTON EARL
11-1415
ALTSHULER BERNARD
11-5735
ALTSHULLER A P
11-6653
ALTSULER S A
11-394
ALVAREZ L W
11-5515 11-9032
ALVAREZ LUIS W
11-12161
ALVIAL G
11-9015
ALY H H
11-10127
AMADO R D
11-10269
AMAI SABURO
11-13409
AMALDI E
11-1996 11-5514
11-10238
AMATI D
11-10340 11-12818
11-12823
AMBLER CHARLES M
11-8627
AMBLER E
11-4971 11-10264
AMDUR I
11-739 11-741
11-742
AMES OAKES
11-8194
AMIEL S
11-6879
AMIEL SAADIA
11-4997 11-8939
AMIRA AKITO
11-13481
AMIS EDWARD S
11-6650
AMMAR R
11-10211
AMOROSI A
11-13958
AMOS L C
11-1323
AMPHLETT A B
11-12005
AMPHLETT C B
11-6318 11-6319
AMPRINO R
11-4290
AMPRINO RODOLFE
11-6190
AMSTER HARVEY
11-1269 11-3196
11-6463 11-13510
AMSTER HARVEY J
11-8112
AMUNDSON N R
11-9279
AMY JONATHAN W
11-8830
ANASTASEVICH V S
11-1193 11-7295
ANDELIN R L
11-212 11-10470
11-13206
ANDERSEN A C
11-5730
ANDERSEN A G H
11-7688
ANDERSEN S L
11-10756
ANDERSON A D
11-4955
ANDERSON A M
11-9607
ANDERSON B L
11-6802
ANDERSON BETTY L
11-3945 11-9391
11-12806
ANDERSON C D
11-5990
ANDERSON C J
11-4430 11-9255
11-10473
ANDERSON CHARLES J
11-5024
ANDERSON D R
11-11874
ANDERSON DAVID M
11-3886 11-6322
ANDERSON DONALD R
11-12640 11-13231
11-13241
ANDERSON E C
11-19
ANDERSON E E
11-6795
ANDERSON E G
11-5130
ANDERSON E L
11-212 11-9835
ANDERSON E V
11-12247
ANDERSON EDGAR
11-5130
ANDERSON EDWARD L JR
11-8875
ANDERSON ERNEST C
11-4584 11-5499
11-8940 11-9943
11-11909
ANDERSON F
11-2150 11-8953
11-9030
ANDERSON G A
11-7024 11-11528
11-13958
ANDERSON G M
11-13722
ANDERSON H E
11-1390
ANDERSON H L
11-9154
ANDERSON J B
11-4109
ANDERSON J D
11-10229
ANDERSON J S
11-4390
ANDERSON JOHN DAVID
11-4115
ANDERSON KERMIT
11-6922
ANDERSON L E
11-2543
ANDERSON MELVIN S
11-13315
ANDERSON N T
11-7136
ANDERSON P J
11-4264
ANDERSON R CHRISTIAN
11-7977
ANDERSON R E
11-11709 11-11829
ANDERSON R H
11-1245
ANDERSON R W
11-10845
ANDERSON T H
11-1805
ANDERSON T O
11-12337
ANDERSON W K
11-13631
ANDERSON W KERMIT
11-3617 11-5335
ANDERSSON G
11-9447 11-9513
11-9514 11-13446
ANDERSSON GORAN
11-5949
ANDES GEORGE M
11-4467
ANDO FUJIO
11-13482
ANDREASSEN K
11-7254
ANDREEV D S
11-4067 11-8142
ANDREEVA O S
11-10414
ANDRESEN H
11-10713
ANDREW KENNETH F
11-5898 11-7994
11-9339
ANDREWS A I
11-6715
ANDREWS G A
11-11049
ANDREWS GOULD A
11-13255
ANDREWS HOWARD L
11-7277
ANDREWS J ROBERT
11-4800
ANDREWS L J
11-2373 11-6998
ANDREWS P S
11-25
ANDREWS P T
11-4593
ANDREWS R B
11-3747
ANDREYEV D S
11-692
ANDRIANKIN E I
11-3902
ANDRIANOV A M
11-430 11-432
ANDRONIKASHVILI E A
11-5485
ANDRUS W S
11-10825
ANDRUS WALTER S
11-13671
ANGEL C W
11-7767
ANGELO RUDOLPH J
11-9219
ANGER H O
11-5113 11-5120
ANGERMAN C L
11-3428
ANGIER R P
11-12496
ANIANSSON GUNNAR
11-13391
ANIKINA M P
11-12201
ANJANEYALU B
11-11118
ANNAS L L
11-7574
ANNO J
11-4076
ANNO J N
11-12536
ANSELONE P M
11-791 11-3787
11-7824
ANSON FRED C
11-4305
ANTHONY D S
11-4802
ANTHONY G W
11-6861 11-9045
ANTHONY L J
11-6594 11-8760
11-9187
ANTHONY S A
11-7040
ANTIPIN L N
11-96 11-1420
11-5191
ANTIPINA A N
11-6152
ANTON NICHOLAS G
11-9005
ANTONEVA N M
11-776
ANTONOVA I A
11-1951 11-3608
ANTUFEV IU P
11-4134
ANTWEILER H J
11-11063 11-13381
APEL CHARLES
11-7938
APEL CHARLES T
11-8820
APELGOT SONIA
11-10797
APERS D
11-6875
APERS D J
11-12861
APIDIANAKIS JOHN C
11-4365 11-12706
APONYI T
11-12386
APOSTOLAKIS A J
11-3961 11-4945
11-4946 11-5972
APPEL H
11-13485
APPLETON W H
11-7033
ARAKI HUZIHIRO
11-13558
ARBMAN E
11-3600 11-10255
ARBMAN EDVIN
11-5949
ARCHIBALD JULIUS A JR
11-1978 11-11736
11-12804 11-13385
ARDEN T V
11-5705 11-7148
ARDENNE M
11-11261
ARDRAN G M
11-9919
AREHART T A
11-189 11-5367
11-7610 11-8336
11-12363
ARENBERG C ARNE
11-6713
ARENDALE W F
11-2360 11-2406
11-11508
ARENDT J W
11-4393
ARETIKYAN B G
11-852
ARGO H V
11-7342
ARGYRIS T S
11-3278
ARKER A J
11-12234
ARLOOK ROBERT S
11-4742
ARMBRUSTER R
11-10758
ARMBRUSTER RAYMOND
11-3582 11-6548
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11-164
BELFORD R LINN
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BENSEY F N JR
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BENUMOF R
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BENYAMINOVICH M B
11-1945
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BERBEZIER J
11-293
BERCY A
11-12147
BERENBAUM R
11-3060 11-4717
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BERERBOM M
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BERGMAN A G
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BERGNER YU K
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BERKO S
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BERKOWITZ JOSEPH
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BERLEY DAVID
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BERLINER SARA
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BERMAN ROBERT
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BERRY CLIFFORD E
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BERSOHN R
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BEUTHER K
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BEVER M B
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BHAGAT S M
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BHANDARI R C
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BHATIA A B
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BHATKI K S
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BHATNAGAR D V
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BHATTACHARAYYA N P
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BHATTACHARYYA RANGALAL
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BHOWMIK B
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BIANCHI J
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BIANCONI ADELE M
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BIASUTTI M
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BIBERMAN L
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BIBERMAN L M
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BICHSEL H
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BICKERTON R J
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BICKING CHARLES A
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BIELAWSKI CHESTER A
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BIELSTEIN HANS O
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BIER K
11-6268
BIERI R
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BIERMAN ENID
11-10678

BIERSCHENK WILLIAM H 11-7159
BIGELEISEN JACOB 11-3347
BIGELOW J E 11-7492
BIGELOW R R 11-1590
BIGOTTE GEORGES 11-1081
BILADEAU ARCHIE L 11-2137
BILLEN DANIEL 11-5739 11-7050
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BILLERBECK C J 11-10966
BILLINGS A M 11-9471
BILLINGS CHARLES E 11-3886
BILLINGTON D S 11-8747
BILLINGTON DOUGLAS S 11-4898
BILODEAU GERALD G 11-7260
BINCER ADAM M 11-5076
BINDER D 11-12291
BINDSCHADLER E 11-1495 11-1496
BINFORD F T 11-2662 11-2763 11-3214 11-4216 11-5614 11-8638 11-9867
BINGEMAN C W 11-4804
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BINGHAM ROBERT 11-12283
BINHAMMER R T 11-5729
BINK NICHOLAS 11-9961
BINNIE G G 11-3672
BIRAM J G S 11-13252
BIRAM M 11-4612
BIRCH FRANCIS 11-7242
BIRCH H J 11-6655
BIRCHENALL C E 11-6388
BIRD J R 11-11449
BIRD R H 11-10304
BIRDSALL D H 11-7871 11-7874 11-12618 11-14017
BIRGE R W 11-1259 11-5514
BIRGE ROBERT W 11-4622
BIRKHOFF GARRETT 11-13507
BIRKHOFF R D 11-6818 11-6954
BIRKHOFF ROBERT D 11-3968 11-7264 11-12156
BIRKNER RUDOLF 11-43 11-1607
BIRKS F T 11-2841 11-3336 11-5221 11-7107
BIRKS J B 11-518
BIRMINGHAM B W 11-7979
BIRMINGHAM J A 11-5252
BIRYUKOV D A 11-11032
BISBY H 11-2840 11-10147
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BISHOP C W 11-9921
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BISHOP J 11-1570
BISHOP L G 11-13112
BISHOP S M 11-13930
BISHOP TOM 11-9118
BISI A 11-775 11-1595 11-1644 11-3602 11-10361 11-12862
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BISSOT T C 11-80
BISWAS N N 11-524 11-2151 11-5469 11-6847 11-9030 11-12173 11-12176
BISWAS S N 11-1625
BITSIANES G 11-2930
BITSIANES GUST 11-7668
BITTER FRANCIS 11-426
BIVINS R L 11-3944
BIXBY D C 11-11583
BIZOT J C 11-10628
BJARKE GEORGE O 11-5794
BJORK R L 11-8895
BJORKLUND C W 11-12414
BJORKLUND F E 11-10910
BJORNHOLM S 11-1995
BLACK A L 11-4804
BLACK BARBARA 11-10424
BLACK J F 11-3738
BLACK STUART C 11-109
BLACKMORE R H 11-13635
BLACKSTOCK WILLIAM J 11-325
BLAHD WILLIAM H 11-5178
BLAINE L R 11-13416
BLAINEY A 11-5877
BLAIR DONALD C 11-9432
BLAIR J M 11-705
BLAIR P M 11-13008
BLAIS N C 11-706
BLAISE JEAN 11-9526
BLAKE C A 11-2356 11-2357 11-2362 11-3361
BLAKE EDWARD S 11-3370
BLAKEY R C 11-4390
BLALOCK G C 11-12976 11-12977 11-12978 11-13614 11-13615
BLANCO E 11-12400
BLANCO E G 11-2330
BLANCO R E 11-1006 11-2819 11-5270 11-7506 11-7509 11-7511 11-7512 11-7513 11-7514 11-7556 11-8359 11-9656 11-9659 11-9666 11-10474 11-10820 11-10836 11-11581 11-11607 11-11618 11-11696 11-12966 11-12995 11-13647 11-13648 11-13649 11-13650 11-13651 11-13652 11-13653 11-13654 11-13656 11-13658 11-13659 11-13660 11-13661 11-13662 11-13682
BLANQUET P 11-4297
BLANQUET PAUL 11-10425
BLANTER M E 11-3861
BLASER J P 11-4597
BLATT F J 11-4499
BLATZ HANSON 11-506 11-11842
BLAU MONTE 11-5969
BLAUGRUND A E 11-6840
BLAUSTEIN BERNARD D 11-5248
BLEANEY B 11-817 11-3218 11-4514 11-8854
BLED$OE L F 11-680
BLEIBERG M L 11-1711 11-8538 11-10900 11-14005
BLEIWEISS J C 11-8533
BLEIWEISS JASON C 11-7686 11-13097
BLETCHLY J D 11-6202
BLEULER K 11-9438
BLEWETT J P 11-732
BLEWITT T H 11-2556 11-7280 11-8905 11-8959 11-9158 11-9159 11-13548
BLIN-STOYLE R J 11-1623 11-6019 11-10269
BLINKS LAWRENCE R 11-8761
BLIX R 11-5950
BLIZARD E P 11-4183 11-13213 11-13219 11-14036
BLOCH CLAUDE 11-6577
BLOCK B P 11-4301
BLOCK E Z 11-8671 11-13618
BLOCK R C 11-10229
BLOECHER F W JR 11-9672 11-13015
BLOEMBERGEN N 11-3016
BLOHINCEV D I 11-4700
BLOK J 11-12863
BLOKHIN N N 11-3658 11-3670
BLOKHINA V D 11-13242
BLOKHINTSEV D I 11-7381
BLOKHINTSEV L D 11-12163
BLOMEKE J O 11-4213 11-11491 11-11802
BLOMSJO E 11-2139
BLONDAL H 11-6215
BLOOM HARRY 11-7102
BLOOM JUSTIN L 11-993
BLOOM M C 11-6722 11-10537
BLOOM MEYER 11-9087
BLOOM MYER 11-6066 11-13450
BLOOM S D 11-4052 11-4712 11-5000 11-5001 11-5002
BLOSSER T V 11-13214
BLOTTNER F G 11-10112
BLOW L W 11-1988
BLOWNEY J S 11-11793
BLOXAM F S 11-11269
BLUCKE W L 11-7698
BLUDMAN SIDNEY A 11-3975 11-13557
BLUE M D 11-7217
BLUEMEL V 11-5052
BLUM J 11-7424
BLUM J F 11-8414 11-9623
BLUM JACQUES M 11-10583
BLUMBERG L 11-592
BLUMBERG R 11-2894
BLUME D 11-1495 11-1496
BLUMENTHAL B 11-3428 11-7894 11-13025
BLUMENTHAL BERNHARD 11-10051
BLUMENTHAL DORIS C 11-1013
BLUTHGEN URSULA 11-8787
BLYHOLDER GEORGE 11-7125
BOADLE C D 11-4695 11-5123 11-5357
BOAG J C 11-5941
BOBONE R 11-7235 11-13452
BOBOVICH YA S 11-794 11-4186
BOCHAGOV B A 11-8091 11-12816
BOCHKOVA O P 11-11294
BOCHVAR I A 11-7078
BOCKELMAN C K 11-1300 11-1302 11-4644 11-4992 11-10763
BOCKMANN KLAUS 11-4637
BOCKRIS J OM 11-5908
BOCKRIS JOHN OM 11-7102
BODANSKY D 11-9023
BODENSTEDT E 11-12251
BODOPYANOV F A 11-5644
BOEHM F 11-1648 11-5547 11-10266 11-13467
BOESCHOTEN F 11-4893 11-11495
BOETTNER RAYMOND C 11-3928
BOGACHEV N P 11-1365
BOGARDUS B J 11-8304 11-13847
BOGART L 11-11322
BOGDANKEVICH O V 11-12927
BOGDANOV F F 11-6334
BOGDANOV G F 11-4129
BOGET D I 11-10553
BOGGS JAMES E 11-11143
BOGLE G S 11-11388
BOGOLIUBOV N N 11-802 11-803
BOGORODITSKII N P 11-7989
BOGORODSKAYA L P 11-6716
BOHANNON J R JR 11-1669
BOHL H JR 11-6802
BOHL HENRY JR 11-1575 11-10865
BOHL L S 11-12233
BOHLMANN E G 11-4678 11-6092 11-8325 11-8326 11-8628 11-8631 11-11598 11-12360
BOHM HORST 11-12060
BOHR A 11-3521 11-7297
BOHR DAVID F 11-830
BOIKINA B S 11-12684
BOIS G V 11-7989
BOIVINET P 11-4816
BOKII G B 11-285
BOKIL INDUMATI 11-118
BOKROS J C 11-9330 11-9331
BOLAND J F 11-13488
BOLAND T J 11-3910
BOLGER J C 11-6526
BOLL IRENE 11-41
BOLLES R C 11-8982
BOLLINGER L M 11-2081 11-4771
BOLLINGER LOWELL M 11-10192 11-10229
BOLLINGER RUSSELL WAYNE 11-5222
BOLLINI C G 11-9049
BOLLINI CARLOS G 11-4967
BOLMGREN C R 11-4048
BOLOTIN L I 11-2178
BOLOTOVSKII B M 11-12308
BOLSHOV V G 11-1954
BOLT R O 11-3438 11-12984
BOLT S E 11-9736
BOLTAX A 11-11710 11-13806
BOLTAX ALVIN 11-5886
BOLTAX B I 11-11233
BOLTON J 11-13861
BOLTON J R 11-11110
BOLWELL H 11-2727
BOLZ LEONARD H 11-260
BOMAN HANS G 11-11849
BOMAR E S 11-7353 11-7689 11-9733 11-13182 11-13897 11-13901
BOMBERGER H B 11-351
BONCH-BRUEVICH V L 11-442
BOND C S 11-1682
BOND G W JR 11-10437
BOND JOHN W JR 11-5939
BOND V P 11-834 11-868 11-4783 11-6610 11-7923 11-8780 11-9967 11-11024
BOND W E 11-1141
BONDELID R O 11-4046 11-10323
BONET A 11-4635 11-10249
BONETTI A 11-12168
BONFER DUWANE C 11-9270 11-9271
BONHAM C E 11-13215
BONILLA CHARLES F 11-10318
BONNER JOHN F 11-1763
BONNER O D 11-5276
BONNER ROBERT 11-132
BONNER T W 11-2089
BONNER WILLIAM A 11-958 11-7096
BONNETT JOHN R 11-12649
BONNIN ANDRE 11-8988
BONOMO FRANCIS S 11-11088

BONPAS MICHEL
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11-13554
BONVENTRE PETER F
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BUSH S H
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BUSHEL ARTHUR
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BYSTROFF ANN SUTTON
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BYSTROV P D
11-371

C

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CAPRON P
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CAPUTO ANTONIO
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CASSIGNOL CHARLES
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CASTON EVELYN O
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CASWELL R S
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CAVANAGH P E
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CAZIER G A
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CERTAINE J
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CERULUS F
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CESCHINO FRANCIS
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CHABOSEAU J
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CHACKETT G A
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CHALLONER A R
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CHAMBERLAIN OWEN
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CIANCETTA A J
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CITRON A
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CLAASSEN R S
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CLASS C M
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CONSALVO VIVIAN F
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COPP D HAROLD
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CORDOVI M A
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CORNGOLD NOEL
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CORNMAN WILMER R
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CORNWELL CLIFFORD G
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CORNWELL P B
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CORP M J
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CORPIERI E F
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CORREY T B
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CORTE M DELLA
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CORTLETT R F
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CORYELL CHARLES D
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COSGROVE JAMES F
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COSGROVE M E
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COSH T A
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COSSEY J R
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COSTA G
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COSTA JAMES J
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COSTRELL L
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COTE R E
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COTTIER HANS
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COTTIN MAURICE
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COTTRELL A H
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COTTRELL WILLIAM B
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COTZIAS GEORGE C
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COUCH J R
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COUCHMAN J C
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COULING S L
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COULSON C A
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COULTAS T A
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COULTER L V
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COURSAGET J
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COURT ANITA JEANNE
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COURT-BROWN W M
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COURTIER G B
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COVINGTON L C
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COWAN CLYDE L JR
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COX A E
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COX A P M
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COX F E
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COX JOHN A JR
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COX S H
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COX SUMMERS H
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CRABTREE J M
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CRAIG D S
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CRAIG DORIS L
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CRAIG HARMON
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CRAIG R S
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CRANDALL W E
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CRANDALL WALTER E
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CRANSTON FREDERICK P JR
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CRAUSSE ETIENNE
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CRAVER LLOYD F
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CRAWFORD F S JR
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CRAWFORD F W
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CRAWFORD FRANK S JR
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CROAN LEONARD S
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CROISSIAUX M
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CROSBIE E A
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CROSSWHITE H M
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CRUSE K
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CRUT M
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CUJEC-DOBOVISEK B
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CURLEE N J
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CURR R M
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CVELBAR F
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CYGAN R
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D

DA COSTA M
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DAANE A H
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F

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H

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K

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11-5840

L

LA BUDDE DONALD
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LABATON V Y
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LIELAUSIS O A
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M

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N

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O

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OSTRANDER HERBERT
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OVERAS H
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OVERHAUSER A W
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OWENS J E
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OWREN H M
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OZHIMKOVA O V
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OZOROFF J
11-2679

P

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PACK D H
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PADDEN T R
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PADGETT D W
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PADMANABHAN V M
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PAGE JOHN P
11-309
PAGE LORNE A
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PAGE W R
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PAGES A P
11-1250
PAGLIA DONALD
11-12517
PAHENICHNIKOV B V
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PAHIS L E
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PAHLER R E
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PAIC M
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PAIS A
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PAITCHEL H
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PAKE G E
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PALANGE R C
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PANGONIS WILLIAM J
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PANISH MORTON B
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PAPISH MORRIS
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PAPKE D M
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PAPOULAR M
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PARFANOVICH D M
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PARK O E
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PARSONS G S
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PEDRETTI A
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PEDRETTI E
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PEVSNER A
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PHILBERT GEORGES
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Q

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R

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S

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T

TABACK L
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U

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V

VAALER L E
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VAN DYKEN A R
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VAN HYNING SAM J
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VAN ITTERBECK A
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VAN LANCKER J
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VAN LIESHOUT R
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VAN MIERT P J
11-62
VAN NAME RALPH G
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VAN ORSDEL JOHN R
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VAN ROSSUM LUDWIG
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VAN RYSSELBERGHE
PIERRE
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VANCE FRANK P
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VANDAKUROV YU V
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VANDALEN E
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VANDONI M R
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VANETSIAN R A
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VANGO STEPHEN P
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VANVELZOR J A
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VANYUKOV M P
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VANZANDT T E
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VARADI P F
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VARANELLI A D
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VARBERG TH
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VARCOE J F
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VARDE M S
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VARFOLOMEEV A A
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VARGA L P
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VARGA RICHARD S
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VARGIN V V
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VARL BOJAN
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VARMA J
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VARSHNI YATENDRA PAL
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VARTAK D G
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VARTAPETIAN H
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VARTAPETIAN HAMLET
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VARTERESZ V
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VARWIG ROBERT L
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VASSERMAN I I
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VAUGHAN D A
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VAVILOV YU N
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VAWTER FRANK J
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VAZE G H
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VAZQUEZ B M
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VDOVIN IU A
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VEALL N
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VEATCH R W JR
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VEINBERG V B
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VEISBEIN M M
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VEKSLER V I
11-1945 11-5644
VELJKOVIC SLOBODANKA R
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VELYAKOV-BODIN I B
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VENEABLE WILLIAM H JR
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VENEDIKTOV A P
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VENKATARAMAN G
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VENKATASUBRAMANIAN V S
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VENKATESWARLU K S
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VENNEN R E VANDER
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VERBINSKI VICTOR V
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VERDE M
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VERGNES MICHEL
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VERHAEGHE JULIEN
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VERKIN B I
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VERLAG S HIRZEL
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VERMA M R
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VERMEULEN T
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VERMUND H
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VERNON A R
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VERONESI P
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VERROCHI W A
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VERSNYDER F L
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VEST R W
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VETTER H
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VETTERLEIN R J
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VICK M M
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VIENET R
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VIER DWAYNE T
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VIGIL F A
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VIGIL V
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VIGNESS I
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VIGNUDELLI A
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VIGONE M
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VIKLUND H I
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VILLANUEVA-MEYER HERBERT
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VILLARS D S
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VILLARS F
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VILLI C
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VINCE ROBERT ARTHUR
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VINEBERG P W
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VINEYARD G H
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VINEYARD GEORGE H
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VINICHENKO E N
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VINING T M
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VIOLET CHARLES E
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VISCARDI JOHN E
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VISCONTI A
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VISHNEVSKY M E
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VISNER S
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VISWANATHAN T S
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VITALE B
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VITOVEC F H
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VIVIAN J E
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VIZSOLYI E I
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VLADIMIRSKY V V
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VLASOV A A
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VLASOV A D
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VOELKER FERDINAND
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VOEVODSKII V V
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VOGT W J
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VOGT-NILSEN NILS
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VOILAND EUGENE E
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VOJINOVIC MIRKO M
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VOJTA G
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VOLCHOK B A
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VOLCHOK HERBERT L
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VOLD C L
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VOLDRICH C B
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VOLKIN HOWARD C
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VOLKOVA M A
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VOLKOVL YU M
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VOLODKO L V
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VOLOSEVICH G N
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VOLPE JOHN
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VOLPE MILTON L
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VOLTA F DALLA
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VON ANTROPOFF A
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VON BORSTEL R C
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VON DARDEL G
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VON GUNTEN H R
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VON HALBAN HANS JR
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VON HERRMANN P
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VON KENSCHITZKI C H
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VON PLANTA C
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VON WINBUSH SAMUEL
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VON ZBOROWSKI H P G A R
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VOORHIS A D
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VORRES KARL S
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VOYLES D E
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VRENKEN L E
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VULFSON K S
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VULIS L A
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VVEDENSKII L E
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VYSKOCIL A
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W

WABER JAMES T
11-1076 11-2484
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WACE P F
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WACKER R E
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WAFFLER H
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WAGGONER M A
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WAHL A M
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WAHLBORN S
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WAHLIG M A
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WAIDE C H
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WAIN A G
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WAINER EUGENE
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WAIT E
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WAITE T R
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WAITS ROBERT K
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WAKABAYASHI R
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WAKASA A
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WAKASA AKIRA
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WAKEFIELD KENNETH E
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WALBRAN V A
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WALCHER W
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WALD BELA
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WALDEGRAVE M
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WALKINSHAW W
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WALL F J
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WALL LEO A
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WALLACE ROGER
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WALLACE W E
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WALLACH SYLVAN
11-2728
WALLACK STANLEY
11-1462
WALLENMEYER W A
11-5476

WALLES K F A 11-12744
WALLIS G 11-5818 11-7138
WALLS J D 11-2466 11-3801 11-3913
WALOSCHEK P 11-524 11-2151 11-9030
WALSH JOHN M 11-6647 11-6648
WALSH RAYMOND R 11-16
WALSH V 11-7736 11-11753
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WALT M 11-3035 11-7285 11-8162
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WALTON G N 11-4566
WALTON J R 11-1423
WALTON JOE R 11-10622
WALTON R B 11-1683 11-13519
WALZ J A 11-9477
WANG P K S 11-4941 11-5444
WANKLYN J N 11-269
WANSINK D H N 11-4904 11-4905 11-7221
WANTLAND J L 11-4848 11-9703
WAPSTRA A H 11-4316 11-9165 11-10266 11-13449 11-13467
WARBURTON E K 11-4711
WARBURTON ERNEST KEELING 11-3008
WARD A G 11-3866 11-6079 11-6527 11-9285
WARD A H 11-11881
WARD CALVIN L 11-6605
WARD F N 11-5290
WARD GILLIAN 11-58 11-2811
WARD HENRY T 11-6921
WARD M 11-11246
WARD THOMAS G 11-9208
WARD THOMAS J 11-12530
WARD W T 11-1226 11-10905
WARDE J M 11-1026 11-8287 11-9901
WARDEN A D 11-12658
WARDLAW W 11-174 11-1472
WARE WILLIAM R 11-11096
WARF JAMES C 11-1474
WARGO P 11-8217
WARHANEK H 11-12866
WARING S 11-4548
WARNER D E 11-3676
WARNER GEORGE F 11-9207
WARNER R M 11-1862 11-11682 11-12027 11-12465
WARNER W T 11-3063
WARR R E 11-281
WARREN B E 11-2184 11-12979
WARREN C G 11-12346
WARREN D T 11-12005
WARREN J B 11-437 11-698 11-1254
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WARREN SHIELDS 11-846 11-4219 11-6196
WARRICKER J B 11-7066
WARSHAW S D 11-575 11-1948 11-2790
WARSHAWSKY I 11-3681
WARTMAN F S 11-4873
WARZEL F M 11-457 11-7825
WASHTELL C C H 11-4578
WASSERBURG G J 11-287
WASSERMAN R H 11-3680 11-4235 11-8816 11-9963 11-11049 11-11888
WATANABE K 11-400 11-6763 11-6764
WATANABE S 11-12189
WATANABE SATOSI 11-10218
WATANABE SHIGUEO 11-4634 11-9180
WATANABE YOSHIHIKO 11-2932
WATANBE K 11-3896
WATARI WATARO 11-2035 11-2049 11-4199 11-4200 11-5661 11-7304 11-7308
WATASE Y 11-400 11-3896 11-6763 11-6764
WATERBURY GLENN R 11-2865 11-5784 11-8847 11-13274
WATERFIELD ANTHONY H 11-10580
WATERMAN T E 11-1527 11-2937 11-5891
WATKINS IVAN 11-4344
WATKINS W B 11-13621
WATSON C D 11-1374 11-7139 11-11053 11-12321 11-12965
WATSON F N 11-13214
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WATSON L B 11-2676
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WATSON LA VERNE C 11-9529
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WATSON W I 11-1020 11-6683
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WATSON WILLIAM W 11-7702
WATSON-MUNRO C N 11-4070
WATT BOB W 11-9106
WATT D A 11-3906 11-5305 11-11519
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WATT GEORGE W 11-10044
WATT ROBERT D 11-10193
WATTENBERG A 11-3021 11-11739
WATTERS HARRY J 11-746
WATTIER J B 11-9157
WATTS NELLIE PERRY 11-143
WATTS R A JR 11-6639 11-9675 11-12372
WATTS RICHARD J 11-2273
WAUGH R C 11-11429 11-12540 11-13340 11-13914
WAY K 11-5536
WAY M E 11-10286
WAYMOUTH JOHN F 11-426
WEARE N E 11-375 11-8936
WEAVER BOYD S 11-12411
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WEBB W L 11-13903
WEBBER W R 11-3448
WEBER A E 11-103 11-3337 11-6655 11-7943
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WEBER C W 11-1
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WEBER LEON 11-4900
WEBER S A 11-12058
WEBER W G 11-12384
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WEBER WILLIAM P 11-5856
WEBSTER D S 11-983 11-7575 11-7818 11-9540 11-11733
WEBSTER GEORGE R 11-9905
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WECHSLER M S 11-5354
WEDDELL J B 11-2022 11-12284
WEDDELL JAMES B 11-6856
WEEKS BOYD M 11-959
WEEKS R A 11-1691
WEEKS T C 11-7860
WEEKS W J 11-1518
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WEIK MARTIN H 11-10635
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WEILL R 11-3513
WEILLS J T 11-7726 11-12390
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WOODY R J
11-10480
WOODY ROBERT J
11-2391
WOOLAND J R
11-7623
WOOLLEN W B
11-10068
WOOLLEY HAROLD W
11-4272 11-12788
WOOLRICH PAUL F
11-1753
WOOLSEY C C
11-5028 11-9464
WOOLSTON J E
11-5018 11-7326
WOOTTON PETER
11-720
WORCESTER J L
11-6061 11-10707
WORCESTER JOHN L
11-11363
WORDSWORTH D V
11-13307
WORLTON D C
11-5583 11-11783
WORMALD J R
11-9038 11-10223
WORMAN FREDERICK C V
11-2236
WORRALL I J
11-4275
WORSHAM J E JR
11-6668
WORTHAM JAMES T
11-6627
WORTMAN R
11-7100 11-7150
WRIGHT B T
11-9566
WRIGHT BYRON T
11-733 11-5058
WRIGHT G T
11-517
WRIGHT H A
11-9998 11-10500
WRIGHT H D
11-4440 11-4444
11-5863 11-6359
WRIGHT H W
11-10156
WRIGHT J H
11-458 11-4547
WRIGHT J M
11-8179 11-14032
WRIGHT R S
11-3135
WRIGHT S C
11-3107
WRIGHT W B
11-3005 11-12894
WRIGHT W B JR
11-7560
WRIGLEY F K
11-9625
WROUGHTON D
11-3250
WROUGHTON DONALD M
11-13756
WRUCK DONALD A
11-330
WU C S
11-779 11-4971
11-9452 11-10264
WU TA-YOU
11-6175
WULF W F
11-1062
WURGER E
11-9525
WURM J G
11-6404
WYANT DONALD G
11-5322
WYATT E I
11-10156
WYATT P J
11-6856
WYCHERLEY V
11-7128
WYCKOFF H O
11-4574
WYKOFF W R
11-163 11-1837
WYKOFF WALTER R
11-3357 11-3598
WYLD H W JR
11-6029 11-6989
11-10224 11-10681
11-12272
WYLER E N
11-300 11-11222
WYLIE R D
11-1537 11-12740
WYLY L D
11-4648 11-6050
WYMER R G
11-2819

Y

YAFET Y
11-3014
YAFFE L
11-196 11-1640
11-4978
YAGGEE F L
11-8917
YAGGEE FRANK L
11-7602 11-7725
YAGI S
11-3364
YAGYU PAUL
11-13237
YAJIMA N
11-13478
YAKOVLEV G N
11-8836

YAKOVLEV YU V
11-1279
YAKOVLEVA E A
11-10449
YAKOVLOVA K K
11-30
YAKUBOV A L
11-10184
YALINSKY N A
11-8962
YALOW ROSALYN S
11-4237
YAMABE SHOTARO
11-9446 11-12202
YAMADA MASAMI
11-5556 11-13475
YAMADA NOBORU
11-13260
YAMAGUCHI TAKASHI
11-4891
YAMAGUCHI YOSHIO
11-13439 11-13442
11-13477 11-13483
YAMAMOTO ALBERT S
11-5894
YAMAMOTO ATSUKO
11-4024 11-5520
11-5521
YAMAMURA S
11-2836
YAMAMURA STANLEY S
11-8846
YAMASHITA TAKAO
11-1768
YAMAZAKI MASATOSHI
11-6662
YAMAZAKI TAKASHI
11-12202
YAMPOLSKII P A
11-2149
YANENKO N N
11-1958
YANG C N
11-579 11-1632
11-6016 11-6981
11-8108 11-10222
11-10381
YANG LING
11-1171
YANKWICH PETER E
11-6643 11-7104
YARHO O O
11-2106 11-12703
YARDLEY M
11-8386
YARMUS LEONARD
11-5735
YAROSLAVSKII N G
11-11486
YASAKI T
11-5927
YASHIN N M
11-2227
YASHUGINA E A
11-9003
YASUMI SHINJIRO
11-9140
YASUNO MASARU
11-5660
YATES B
11-4878 11-12665
YAVLINSKII N A
11-11287
YAVOISKII V I
11-10570
YAVOR I P
11-8099
YAVORSKAYA I M
11-12782
YAWATAYA TADASHI
11-1829 11-13295
YEAGER HAROLD
11-10831 11-12396
11-13012
YEAGER J H
11-8393 11-13679
YEAGER J HAROLD
11-9634 11-9643
11-9650 11-9677
YEARIAN H J
11-281
YEATER M L
11-1306 11-3093
11-6459 11-10370
11-11327
YEATTS L B
11-9214
YEKUTIELI G
11-3984 11-10337
YENNIE D R
11-1364 11-1609
11-5062 11-5522
11-10262
YEOMAN F A
11-1495
YERGIN PAUL F
11-3037 11-3088
YERKOVICH LUKE A
11-1051
YIANNAKOPOULOS APOSTOLOS
11-39
YINGST H E
11-2949
YOCCOZ J
11-8130 11-8160
YOCCOZ JEAN
11-5503
YODER R E
11-1029 11-1030
YODH G B
11-4598
YODIS A W
11-7970
YOKE J T III
11-80
YOKOKAWA TOSHIO
11-2932
YOKOYAMA YUJI
11-1872
YOMOSA SIGEO
11-3423
YONEZAWA MINORU
11-5472 11-5483
11-13408
YOON TAEK-SOON
11-1197
YOSHIDA S
11-1368 11-3449
11-7352
YOSHIDA SUSUMU
11-1904
YOSHIZAWA YASUKAZU
11-4970 11-9512
YOSIN S J
11-4812 11-7548
11-8321 11-8390
11-12666 11-13680
YOST HENRY T JR
11-8773
YOUDEN W J
11-6569
YOUDEN WILLIAM
11-1499
YOUNG ARTHUR P
11-3853
YOUNG C T
11-6295 11-7711
11-8312 11-8389
11-12487 11-12982
YOUNG D S
11-13955
YOUNG DWIGHT S
11-2974
YOUNG E HOWARD
11-334 11-13346
YOUNG EDWARD L
11-6106
YOUNG EDWIN H
11-6329
YOUNG G
11-11777
YOUNG GALE
11-5602 11-7815
11-8581 11-13915
YOUNG GALE J
11-5106
YOUNG GIFFORD A
11-2226 11-4849
11-10049
YOUNG J N
11-6993
YOUNG J R
11-5325
YOUNG JOSEPH N
11-8976 11-11283
YOUNG M S
11-2374
YOUNG NELSON F
11-11022
YOUNG R C
11-10382
YOUNG ROBERT C
11-3206
YOUNGBLOOD E LLOYD
11-2460 11-2461
11-2463
YOUNGSTROM KARL
11-11020
YOUNT REED E
11-10892
YOUTZ M A
11-8327 11-8330
YOVANOVITCH D D
11-1948
YPSILANTIS T J
11-4153 11-4154
YUAN LUKE C L
11-5996
YUASA TOSIKO
11-3512 11-6832
YUDIN YU G
11-13243
YUDINTSEVA E V
11-11048
YUENGER CARL F
11-7161
YUHL ERIC T
11-7083
YUKAWA HIDEKI
11-8243
YUKAWA JIRO
11-5519
YUSHINA L D
11-3365
YUSTER P H
11-1552 11-1553
YUTLANDOV I A
11-470 11-10320
YVON J
11-6008

Z

ZABALA I
11-684
ZABEL C W
11-5535 11-10247
11-12570 11-13115
11-13116 11-13117
11-13858
ZABETAKIS MICHAEL G
11-74 11-75
11-2920 11-10150
11-12105
ZABOZLAEVA E A
11-839 11-3286
11-6603
ZACEPIN G T
11-563
ZACHARIAS J R
11-10703
ZACHARIASEN F
11-532 11-5077
ZADUMKIN S N
11-6400
ZAEHRINGER ALFRED J
11-9121
ZAFFARANO D
11-3586
ZAGER WILLIAM J
11-13344
ZAGO G
11-1677 11-5983
ZAHLAN ANTOINE B
11-6669
ZAIDEL A N
11-6288 11-7119
11-13300
ZAIKOVSKII F V
11-1833
ZAIRATAYANTS V B
11-3663
ZAIS A
11-8442 11-10869
ZAITSEV G A
11-10373 11-10790
ZAJICEK J
11-4791
ZAKHAROVA V M
11-10603
ZAKUTINSKII D I
11-5722
ZALKIN ALLAN
11-1183 11-1782
ZAMBROW J L
11-9749 11-12434
11-12589
ZAMCHALOVA E A
11-3898 11-3996
ZAMITH A A L
11-6687
ZANGGER CL
11-3530
ZANICHELLI NICOLA
11-5504
ZAPP E E
11-11931
ZAPP F C
11-638 11-640
11-4078 11-4666
11-7764 11-7771
11-8600 11-8613
11-9811 11-10927
11-10929 11-10978
11-12535 11-13905
11-13910
ZAPPA L
11-775 11-1595
11-1644 11-3602
11-10361 11-12862
ZARIPOV M M
11-10251
ZASLAVSKAYA L V
11-1157
ZASLAVSKII YU S
11-279
ZASLER J
11-8552
ZASTAVENKO L G
11-9411
ZAVARIKHINA G B
11-123
ZAVATTARELLI R
11-12014
ZAVOISKII E K
11-5417 11-6446
ZDANSKY ERICH
11-6625
ZEBROSKI E
11-7533 11-9667
ZEBROSKI EDWIN L
11-7453 11-7534
11-13284
ZEEMAN P B
11-4320
ZEGLER S T
11-1909 11-7628
11-7895 11-7896
11-10922
ZEIDLITS A I
11-5644
ZEIGLER R K
11-1 11-13456
ZEITLER VERNON A
11-73
ZEITLIN H R
11-3377 11-13906
ZELDES HENRY
11-4605 11-7373
ZELDES NISSAN
11-562
ZELDOVICH IA B
12-1286 11-4001
ZELENKEVICH G P
11-1971
ZELLER H D
11-1088
ZEMACH A C
11-3056
ZEMACH CHARLES
11-6169
ZEMLYANOI A G
11-3911 11-6152
ZENDLE BERNARD
11-4587
ZERBE J E
11-2729 11-5299
11-10992 11-12606
ZERBY C D
11-552 11-2162
11-3509 11-4182
11-4931 11-7286
ZERBY CLAYTON D
11-8589
ZESCHKE GUNTER
11-223 11-295
11-298
ZHAVORONKOV N M
11-3762 11-5769
11-6298
ZHDANOV G B
11-1937
ZHDANOV G S
11-379 11-10571
ZHEREBETSOVA K I
11-4126
ZHERNOVOI A I
11-8118
ZHGUN A A
11-3312
ZHITNIKOV R A
11-6012
ZHUKOVSKII N N
11-3611 11-4042
ZHURAVLEV N N
11-10571
ZHURKOV S N
11-12160
ZICHICHI A
11-3501 11-10201
ZICKEL J
11-9833
ZICKEL JOHN
11-2450 11-2703
ZICKRICK LYALL
11-10960
ZIEGER H J
11-5803
ZIEGLER A
11-9484
ZIEGLER C A
11-3488 11-4944
11-9025
ZIEGLER HANS
11-7165
ZIEGLER N F
11-2743
ZIEGLER W T
11-11484 11-11989
ZIELASEK G
11-3877
ZIEMBA F P
11-12763
ZIGRANG D J
11-13967
ZIMEN K E
11-5953
ZIMERMAN A H
11-4958
ZIMIN A G
11-2227
ZIMMER H
11-11090
ZIMMER K G
11-171 11-2982
ZIMMER KARL G
11-1608 11-10029
ZIMMER LAWRENCE T
11-11321
ZIMMERMAN E L
11-14016
ZIMMERMAN EDWARD J
11-5436 11-5532
ZIMMERMAN R L
11-2066 11-5678
11-10229
ZIMMERMANN H J
11-1920 11-5369
11-8025 11-13358
ZIMMERMANN W
11-12945
ZIMMERMANN W JR
11-1348
ZINN W H
11-1343 11-5118
11-7026 11-9570
11-12601
ZINOVEVA E G
11-1738
ZIPOY D
11-6063
ZIRKIND R
11-8570
ZIRKLE R E
11-11537
ZIRKLE RAYMOND E
11-833
ZISMAN W A
11-258
ZITEK C J B
11-1343
ZIZZO S G
11-8744
ZMOLA P C
11-2658 11-7752
11-7754 11-7783
11-7808 11-11759
11-13896
ZOCH H L
11-9834
ZOLLER R E
11-6917
ZOLOTOV YU A
11-9274 11-10494
ZOLOTUKHIN V K
11-125
ZOLTOV YU A
11-12713
ZOMOV I V
11-12112
ZONIS IRWIN S
11-2248
ZORN J B
11-1837
ZORZOLI G B
11-5671
ZOTEV YU A
11-357
ZOUCKERMANN R
11-6948
ZRELOV V P
11-1676 11-4600
11-4601
ZSULA J
11-9249
ZUBAREV D N
11-5495
ZUBOVA G A
11-11943
ZUCKER A
11-701 11-6933
ZUCKER M Z
11-2085
ZUCKER SANDRA
11-1235
ZULLIGER A
11-7762
ZUPANCIC CRTOMIUR
11-2146 11-6137
ZUTSHI P K
11-5419
ZVEREVA N P
11-9168
ZWEIFACH B W
11-5159
ZWEIFEL P F
11-480 11-1382
11-3027 11-8184
11-10610 11-10912
ZWICK JACOB W
11-10163 11-10164
ZWICKLER S
11-11147 11-12717
ZYRYANOVA L N
11-557 11-8065
11-8239
ZYSKOWSKI C
11-5781 11-12347
ZYZES F C
11-10536

CORPORATE AUTHOR INDEX FOR VOLUME 11

For each reference the digits preceding the dash are the volume numbers and digits after the dash are the abstract numbers.

A

ADMIRAL CORP., CHICAGO.
11-6148 11-8215
ADVANCED SCIENTIFIC TECHNIQUES RESEARCH ASSOCIATES, MILFORD, CONN.
11-6886 11-8163
11-10275 11-12241
AEROJET GENERAL CORP., AZUSA, CALIF.
11-304 11-1032
11-3394 11-3834
11-3835 11-4412
11-4448 11-5330
11-6324 11-6703
11-6704 11-8916
11-10884 11-10885
11-10886 11-11160
11-12012 11-12891
11-13308 11-13574
AERONUTRONIC SYSTEMS, INC., GLENDALE, CALIF.
11-12212
AEROPROJECTS, INC., WEST CHESTER, PENNA.
11-185 11-1822
11-2921 11-2922
11-4363 11-5889
11-7197 11-8943
11-9256 11-10111
11-11207
AIR FORCE SPECIAL WEAPONS CENTER, KIRTLAND AFB, N. MEX.
11-11036
ALABAMA. UNIV., TUSCALOOSA. BUREAU OF ENG. RESEARCH.
11-2935
ALCO PRODUCTS, INC., SCHENECTADY, N. Y.
11-1976 11-2097
11-2098 11-2099
11-2100 11-2101
11-2102 11-2195
11-6885 11-6886
11-7322 11-7323
11-8163 11-8231
11-10634 11-10720
11-10721 11-11183
11-13872 11-13873
11-13874 11-13875
11-13876 11-13877
11-13878
ALFRED UNIV., ALFRED, N. Y.
11-11180
ALLEGHENY LUDLUM STEEL CORP. RESEARCH DEPT., WATERVLIET, N. Y.
11-1139 11-5326
ALLIED CHEMICAL AND DYE CORP. GENERAL CHEMICAL DIV., NEW YORK
11-7970
ALLIS-CHALMERS MFG. CO., MILWAUKEE.
11-2443 11-2465
ALLSTATES DESIGN AND DEVELOPMENT CO., INC., TRENTON.
11-12896
ALUMINUM CO. OF AMERICA. ALCOA PROCESS DEV LABS., NEW KENSINGTON, PENNA.
11-11705
ALUMINUM CO. OF AMERICA, PITTSBURGH.
11-12731
AMERICAN CYANAMID CO. ATOMIC ENERGY DIV., IDAHO FALLS, IDAHO.
11-2297 11-2343
11-8279 11-8378
11-8457 11-8458
11-11624 11-11658
11-13000 11-13001
11-13030 11-13668
11-14041
AMERICAN CYANAMID CO. ATOMIC ENERGY DIV. RAW MAT. DEV. LAB., WINCHESTER MASS.
11-11595
AMERICAN CYANAMID CO. ATOMIC ENERGY DIV., WATERTOWN, MASS.
11-9672
AMERICAN CYANAMID CO., NEW YORK.
11-7479
AMERICAN CYANAMID CO. STAMFORD LABS., STAMFORD, CONN.
11-8299
AMERICAN CYANAMID CO. STAMFORD RESEARCH LABS., STAMFORD, CONN.
11-7403
AMERICAN ELECTRO METAL CORP., YONKERS, N. Y.
11-324
AMERICAN MACHINE AND FOUNDRY CO., CHICAGO.
11-4484
AMERICAN MACHINE AND FOUNDRY CO. GENERAL ENGINEERING LAB., GREENWICH, CONN.
11-2727 11-4663
11-7717 11-13861
11-13862
AMERICAN MACHINE AND FOUNDRY CO. GREENWICH LAB., GREENWICH, CONN.
11-11741
AMERICAN MEAT INSTITUTE FOUNDATION, CHICAGO.
11-828
AMERICAN RAD. & STD. SAN. CORP. ATOMIC ENERGY DIV., REDWOOD CITY, CALIF.
11-3475 11-4075
11-6068 11-6523
11-6524 11-12853
AMES LAB., AMES, IOWA.
11-312 11-1808
11-1810 11-1811
11-1878 11-2367
11-2420 11-2473
11-2813 11-2828
11-2851 11-2857
11-2915 11-4003
11-4453 11-4454
11-4464 11-4542
11-4632 11-4748
11-4810 11-4843
11-4879 11-5069
11-5258 11-5259
11-5334 11-6108
11-7210 11-7418
11-7428 11-7532
11-7667 11-7672
11-7673 11-7674
11-7675 11-7676
11-7677 11-7692
11-8117 11-8506
11-8507 11-8508
11-8509 11-8510
11-8511 11-8512
11-8820 11-9325
11-9740 11-10109
11-10428 11-10471
11-10883 11-11055
11-11111 11-11625
11-11626 11-11652
11-11700 11-11701
11-11702 11-11703
11-11704 11-11978
11-12322 11-12353
11-12468 11-12732
11-13083 11-13669
11-13794
AMHERST COLL., MASS.
11-3405
AMSTERDAM. UNIVERSITEIT.
11-3940 11-12798
ARCOS CORP., PHILADELPHIA.
11-3846
ARGENTINA. COMISION NACIONAL DE ENERGIA ATOMICA, BUENOS AIRES.
11-13327
ARGONNE CANCER RESEARCH HOSPITAL, CHICAGO.
11-5132 11-11321
11-13229
ARGONNE NATIONAL LAB., LEMONT, ILL.
11-478 11-550
11-636 11-833
11-893 11-969
11-1123 11-1314
11-1355 11-1426
11-1579 11-2026
11-2221 11-2222
11-2264 11-2493
11-2632 11-2675
11-2769 11-2898
11-2919 11-2975
11-3126 11-3544
11-4072 11-4073
11-4162 11-4413
11-4664 11-4665
11-4781 11-4846
11-5004 11-5562
11-5563 11-5564
11-5565 11-5566
11-5573 11-6000
11-6071 11-6072
11-6521 11-6522
11-6717 11-6718
11-6734 11-6863
11-6884 11-7155
11-7184 11-7291
11-7399 11-7404
11-7405 11-7406
11-7407 11-7408
11-7455 11-7465
11-7466 11-7467
11-7567 11-7568
11-7602 11-7622
11-7623 11-7624
11-7625 11-7626
11-7627 11-7628
11-7629 11-7630
11-7690 11-7707
11-7708 11-7718
11-7719 11-7720
11-7721 11-7722
11-7723 11-7724
11-7725 11-7726
11-7863 11-7864
11-7866 11-7882
11-7883 11-7884
11-7892 11-7893
11-7894 11-7895
11-7896 11-7910
11-8199 11-8246
11-8264 11-8265
11-8266 11-8267
11-8305 11-8308
11-8319 11-8322
11-8323 11-8324
11-8400 11-8401
11-8461 11-8462
11-8541 11-8562
11-8575 11-8892
11-8917 11-9090
11-9091 11-9223
11-9245 11-9253
11-9283 11-9286
11-9323 11-9399
11-9441 11-9578
11-9579 11-9580
11-9581 11-9609
11-9610 11-9667
11-9715 11-9716
11-9717 11-9718
11-9727 11-9728
11-9752 11-9753
11-9762 11-9774
11-9775 11-9779
11-9780 11-9781
11-9782 11-9783
11-9784 11-9785
11-9786 11-9787
11-9788 11-9870
11-9889 11-9898
11-10048 11-10173
11-10231 11-10409
11-10584 11-10633
11-10717 11-10718
11-10719 11-10818
11-10841 11-10842
11-10872 11-10887
11-10921 11-10922
11-10923 11-11103
11-11105 11-11283
11-11390 11-11392
11-11393 11-11446
11-11493 11-11562
11-11563 11-11564
11-11565 11-11589
11-11596 11-11687
11-11688 11-11689
11-11739 11-11740
11-11742 11-11743
11-11744 11-11745
11-11746 11-11747
11-11748 11-12213
11-12357 11-12415
11-12458 11-12469
11-12470 11-12521
11-12591 11-12642
11-12716 11-12731
11-12739 11-12873
11-12963 11-13025
11-13058 11-13185
11-13199 11-13488
11-13561 11-13575
11-13576 11-13577
11-13578 11-13579
11-13580 11-13581
11-13582 11-13623
11-13633 11-13723
11-13763 11-13764
11-13765 11-13766
11-13863 11-13864
11-13865 11-13866
11-13867 11-13868
11-13869 11-13870
11-14024
ARKANSAS. UNIV., FAYETTEVILLE.
11-3329 11-7112
11-10623
ARKANSAS. UNIV., FAYETTEVILLE. COLL. OF ARTS AND SCIENCES.
11-4184
ARMED SERVICES TECH. INF. AGENCY REF. CENT., LIB. OF CONG., WASHINGTON, D.C.
11-169 11-170
ARMOUR FERTILIZER WORKS, BARTOW, FLA.
11-2854
ARMY MEDICAL RESEARCH LAB., FORT KNOX, KY.
11-7919 11-11324
ARNOLD ENGINEERING DEVELOPMENT CENTER, TULLAHOMA, TENN.
11-5940
ATOMIC BOMB CASUALTY COMMISSION, HIROSHIMA.
11-8763
ATOMIC ELECTRIC PROJECT, ST. LOUIS.
11-12595 11-13860

ATOMIC ENERGY OF CANADA LTD. CHALK RIVER PROJECT, CHALK RIVER, ONT.
11-593 11-1231
11-1267 11-1278
11-1319 11-1320
11-1636 11-1864
11-2027 11-2899
11-2961 11-2976
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11-4631 11-4681
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11-12899 11-13266
11-13443 11-13444
11-13489 11-13506

ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT.
11-2103 11-2104
11-5882 11-6887
11-7569 11-7727
11-8469 11-10276
11-11710 11-12622
11-13879

ATOMICS INTERNATIONAL DIV., N. AMERICAN AVIATION, INC., CANOGA PARK, CALIF.
11-1128 11-1289
11-3204 11-3682
11-3756 11-3757
11-4095 11-4096
11-4812 11-5025
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11-5586 11-5780
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11-12239 11-12240
11-12309 11-12487
11-12666 11-12702
11-12872 11-12895
11-13292 11-13503
11-13680 11-13969

AUBURN RESEARCH FOUNDATION, AUBURN, ALA.
11-12737

AUSTRALIA. AERONAUTICAL RESEARCH LABS., FISHERMENS BEND, VICTORIA.
11-6735

B

BABCOCK AND WILCOX CO. ATOMIC ENERGY DIV., LYNCHBURG, VA.
11-12214 11-12215
11-12216 11-12217
11-12875

BABCOCK AND WILCOX CO., NEW YORK.
11-652 11-2714
11-2715 11-2717
11-12740

BABCOCK AND WILCOX CO. RESEARCH CENTER, ALLIANCE, OHIO.
11-2499 11-2541
11-2542 11-3780
11-4354 11-5890
11-12730

BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD.
11-455 11-6889
11-10635

BARTOL RESEARCH FOUNDATION, PHILADELPHIA.
11-384 11-6866

BARTOL RESEARCH FOUNDATION, SWARTHMORE, PENNA.
11-4854

BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
11-300 11-305
11-306 11-327
11-333 11-811
11-812 11-905
11-977 11-1017
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11-1135 11-1501
11-1710 11-2305
11-2307 11-2308
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11-13790 11-13880
11-13881

BATTELLE MEMORIAL INST. RADIATION EFFECTS INFO. CENTER, COLUMBUS, OHIO.
11-11472 11-11473

BATTELLE MEMORIAL INST., TITANIUM METALLURGICAL LAB., COLUMBUS, OHIO.
11-321 11-322
11-1134 11-1869
11-1883 11-2923
11-3848 11-4465
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11-5887 11-6259
11-6378 11-6379
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11-6383 11-6385
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11-8006 11-8923
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11-11212 11-11213
11-11214 11-11219
11-11256 11-12053
11-12054 11-12056
11-12745 11-12746
11-12747 11-12748
11-13341

BAYLOR UNIV., WACO, TEX.
11-5756 11-6229

BECHTEL CORP., SAN FRANCISCO.
11-10809 11-12596

BERYLLIUM CORP., READING, PENNA.
11-10524

BETHLEHEM STEEL CO. SHIP-BUILDING DIV., QUINCY, MASS.
11-3646

BLAW-KNOX CONSTRUCTION CO. CHEMICAL PLANTS DIV., IDAHO FALLS, IDAHO.
11-2766

BLOCKSON CHEMICAL CO., JOLIET, ILL.
11-2861

BOEING AIRPLANE CO., SEATTLE.
11-6149 11-7310
11-12691

BOSTON UNIV.
11-3681 11-8819

BRASIL. ESCOLA NACIONAL DE QUIMICA, RIO DE JANEIRO.
11-5764

BRIDGEPORT BRASS CO., COMN.
11-2498 11-2914
11-6991 11-7645
11-7646 11-8002
11-8475

BROOKHAVEN NATIONAL LAB., NEUTRON CROSS SECT. COMP. GR., UPTON, N. Y.
11-8137

BROOKHAVEN NATIONAL LAB., UPTON, N. Y.
11-12 11-832
11-834 11-1372
11-1377 11-2294
11-2407 11-2633
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11-13886

BROOKLYN COLL., NEW YORK.
11-10396

BROOKLYN, POLYTECHNIC INST.
11-255

BROWN UNIV., PROVIDENCE.
11-3596

BROWN UNIV., PROVIDENCE, GRADUATE DIV. OF APPLIED MATHEMATICS.
11-7165

BROWN UNIV., PROVIDENCE, METALS RESEARCH LAB.
11-762

BRUSH BERYLLIUM CO., CLEVELAND
11-1875 11-2290
11-2494 11-2495
11-2496 11-2497
11-2517 11-2518
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11-11692 11-12492
11-13095

BRUSSELS. CENTRE DETUDES POUR LES APPLICATIONS DE LENERGIE NUCLEAIRE.
11-6682 11-6815
11-6816 11-6817
11-6905 11-6906
11-6963 11-7089

BRUSSELS. UNIVERSITE. LABORATOIRE DE CHIMIE PHYSIQUE MOLECULAIRE.
11-11218

BUREAU OF AERONAUTICS NAVY.
11-12667

BUREAU OF MINES.
11-181 11-3404
11-3695 11-3819
11-3820 11-3821
11-3822 11-3823
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11-4864 11-4865
11-4866 11-4872
11-4873 11-5315
11-5316 11-6736
11-7185 11-10551
11-13335

BUREAU OF MINES, DIV. OF EXPLOSIVES TECHNOLOGY, PITTSBURGH.
11-74 11-75
11-79 11-11913
11-12105

BUREAU OF MINES, DIV. OF SOLID FUELS TECHNOLOGY, PITTSBURGH.
11-3440
BUREAU OF MINES, INTERMOUNTAIN EXPERIMENT STATION, SALT LAKE CITY.
11-176 11-1809
BUREAU OF MINES, NORTHWEST ELECTRODEVELOPMENT EX. STATION, ALBANY, OREG.
11-5331
BUREAU OF MINES, NORTHWEST ELECTRODEVELOPMENT LAB., ALBANY, OREG.
11-10873 11-10888
11-10899 11-13059
11-13060 11-13061
11-13062 11-13063
11-13064 11-13066
11-13067 11-13068
11-13069 11-13070
11-13071 11-13072
11-13073 11-13074
11-13075
BURNS AND MCDONNELL ENG. CO., KANSAS CITY, MO.
11-5826

C

CALIFORNIA INST. OF TECH., PASADENA.
11-10558
CALIFORNIA INST. OF TECH., PASADENA. JET PROPULSION LAB.
11-273 11-274
11-1075 11-5857
11-7163
CALIFORNIA. OFFICE OF CIVIL DEFENSE, SACRAMENTO.
11-1751
CALIFORNIA RESEARCH AND DEV. CO., BERKELEY, CALIF.
11-8438 11-13201
11-13202
CALIFORNIA RESEARCH AND DEV. CO., LIVERMORE, CALIF.
11-2707 11-2708
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CALIFORNIA RESEARCH AND DEV. CO. LIVERMORE RESEARCH LAB., LIVERMORE, CALIF.
11-2709 11-7868
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CALIFORNIA RESEARCH CORP., RICHMOND, CALIF.
11-2895 11-3438
11-8822 11-12693
11-12984 11-12985
CALIFORNIA. STATE HOSPITAL, STOCKTON.
11-4221
CALIFORNIA. UNIV., BERKELEY. DIV. OF MEDICAL PHYSICS.
11-4225
CALIFORNIA. UNIV., BERKELEY. INST. OF ENGINEERING RESEARCH.
11-6323
CALIFORNIA. UNIV., BERKELEY. MINERALS RESEARCH LAB.
11-1543 11-2918
11-3422 11-13332
CALIFORNIA. UNIV., BERKELEY. RADIATION LAB.
11-20 11-164
11-386 11-549
11-595 11-717
11-718 11-770
11-898 11-911
11-959 11-1060
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11-13837 11-13838
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CALIFORNIA. UNIV., LIVERMORE. RADIATION LAB.
11-596 11-993
11-1183 11-1554
11-1782 11-1983
11-3453 11-4116
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11-11259 11-12289
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11-13361 11-13505
CALIFORNIA. UNIV., LOS ANGELES.
11-521 11-12687
CALIFORNIA. UNIV., LOS ANGELES. ATOMIC ENERGY PROJECT
11-108 11-897
11-1431 11-1725
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11-12961 11-13247
11-13565 11-13566
CALIFORNIA. UNIV., SAN FRANCISCO. SCHOOL OF MEDICINE. RADIOLOGICAL LAB
11-21 11-6596
11-13234
CALLERY CHEMICAL CO., PENNA.
11-103 11-955
11-3326 11-3327
11-3337 11-3681
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11-11080
CAMBRIDGE CORP., CAMBRIDGE, MASS.
11-13374
CAMBRIDGE UNIV., ENGLAND.
11-13379
CANADA. DEPT. OF MINES.
11-4824
CANADA. DEPT. OF MINES AND TECHNICAL SURVEYS. MINES BRANCH.
11-105 11-1508
11-3758 11-11176
CANADA. DEPT. OF NATIONAL HEALTH AND WELFARE, OTTAWA.
11-5172 11-5255
CANADIAN GENERAL ELECTRIC CO., LTD., TORONTO.
11-9463
CARBIDE AND CARBON CHEMICALS CORP. K-25 PLANT, OAK RIDGE, TENN.
11-2238 11-2248
11-2256 11-2257
11-2268 11-2272
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11-12420 11-12442
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11-12633 11-13147
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11-13697 11-13855
CARBIDE AND CARBON CHEMICALS CORP., OAK RIDGE, TENN.
11-8419 11-13695
CARBIDE AND CARBON CHEMICALS CORP. SUBSTITUTE ALLOY MATERIALS LAB., N. Y.
11-9759
CARBIDE AND CARBON CHEMICALS CORP. Y-12 PLANT, OAK RIDGE, TENN.
11-2283 11-2359
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11-13571 11-13602
11-13706 11-13707
CARBIDE & CARBON CHEMICALS DIV., K-25 PLANT, OAK RIDGE, TENN.
11-2287 11-2289
11-2306 11-2378
11-2379 11-2425
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11-11639 11-11640
11-11641 11-11642
11-11738 11-13008
11-13696
CARBORUNDUM METALS CO., INC., AKRON, N. Y.
11-7984 11-9981
CARNEGIE INST. OF TECH., PITTSBURGH.
11-7358 11-8309
11-10092 11-12037
CARNEGIE INST. OF TECH., PITTSBURGH. LAB. FOR MAGNETICS RESEARCH.
11-5342 11-8920
CARNEGIE INST. OF TECH., PITTSBURGH. METALS RESEARCH LAB.
11-3424 11-3441
11-4467
CASE INST. OF TECH., CLEVELAND.
11-1873 11-3393
11-5346 11-5874
11-5897 11-7195
11-10528 11-10549
11-11216 11-12750
11-13342
CATALYTIC CONSTRUCTION CO., PHILADELPHIA.
11-9641 11-12361
CENTRAL INST. FOR INDUSTRIAL RESEARCH, BLINDERN, OSLO, NORWAY.
11-11224
CENTRO INFORMAZIONI STUDI ESPERIENZE, MILAN.
11-5946 11-6077
11-6442 11-9371
11-11403 11-13388
CHEMICAL AND RADIOLOGICAL LABS., ARMY CHEMICAL CENTER, MD.
11-3375 11-4850
CHEMICAL CORPS ENGINEERING AGENCY, ARMY CHEMICAL CENTER, MD.
11-1499
CHEMICAL WARFARE LABS., ARMY CHEMICAL CENTER, MD.
11-11018
CHICAGO DEVELOPMENT CORP., RIVERDALE, MD.
11-4459 11-12674
CHICAGO OPERATIONS OFFICE, AEC.
11-13916
CHICAGO. UNIV.
11-2919 11-3107
CHICAGO. UNIV. AIR FORCE RADIATION LAB.
11-2779 11-4226
11-9915 11-11841
CHICAGO. UNIV. DEPT. OF MEDICINE.
11-18 11-12641
CHICAGO. UNIV. ENRICO FERMI INST. FOR NUCLEAR STUDIES.
11-2220 11-3690
11-6612 11-6613
CHICAGO. UNIV. METALLURGICAL LAB.
11-2677 11-2770
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CHILDRENS CANCER RESEARCH FOUNDATION, BOSTON
11-1392

CINCINNATI, UNIV. RESEARCH FOUNDATION.
11-10226

CLEVITE RESEARCH CENTER, CLEVELAND.
11-8007 11-11217

CLIMAX MOLYBDENUM CO. OF MICHIGAN, DETROIT.
11-5348 11-12749

CLINTON LABS., OAK RIDGE, TENN.
11-2298 11-2412
11-2676 11-2710
11-2718 11-2980
11-7419 11-7420
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11-13960 11-13961
11-14030

CLINTON NATIONAL LAB., OAK RIDGE, TENN.
11-7682

COLLEGE DE FRANCE, PARIS.
11-9053

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION, INC., GOLDEN.
11-7192 11-7971
11-8871 11-10478
11-10479 11-12704

COLORADO, UNIV., BOULDER, GRADUATE SCHOOL.
11-907

COLUMBIA UNIV., IRVINGTON-ON-HUDSON, N. Y. NEVIS CYCLOTRON LABS.
11-5494

COLUMBIA UNIV., NEW YORK.
11-1229 11-2815
11-6387 11-8037
11-9276 11-9668
11-10770 11-12443

COLUMBIA UNIV., NEW YORK. COLUMBIA RADIATION LAB.
11-1383 11-4489
11-12177

COLUMBIA UNIV., NEW YORK. DIV. OF WAR RESEARCH.
11-132 11-1788
11-2369 11-2370
11-7401 11-7433
11-7434 11-7442
11-7561 11-7701
11-7716 11-8262
11-8263 11-8399
11-8551 11-8555
11-9670 11-11593
11-11594 11-11826
11-13843

COLUMBIA UNIV., NEW YORK. ELECTRONICS RESEARCH LABS.
11-10512

COLUMBIA UNIV., NEW YORK. MINERAL BENEFICIATION LAB.
11-3760 11-7145

COLUMBIA UNIV., NEW YORK. NUCLEAR PHYSICS LABS.
11-551 11-1273
11-1274 11-7292
11-10232 11-10686
11-10687

COLUMBIA UNIV., NEW YORK. PEGRAM LAB.
11-768 11-1219
11-8996 11-9068

COLUMBIA UNIV., NEW YORK. PUPIN CYCLOTRON LAB.
11-1219 11-3951

COLUMBIA UNIV., NEW YORK. PUPIN PHYSICS LABS.
11-768 11-8996
11-9068

COLUMBIA UNIV., NEW YORK. RADIOLOGICAL RESEARCH LAB.
11-3479

COLUMBIA UNIV., NEW YORK. SCHOOL OF MINES.
11-1181 11-3324
11-7932

COLUMBIA UNIV., NEW YORK. SUBSTITUTE ALLOY MATERIALS LAB.
11-7443 11-12325

COMBUSTION ENGINEERING, INC. REACTOR DEVELOPMENT DIV., NEW YORK.
11-4012

COMBUSTION ENGINEERING, INC. REACTOR DEVELOPMENT DIV., WINDSOR, CONN.
11-12133 11-13889

COMMONWEALTH EDISON CO., CEPS GROUP, CHICAGO.
11-637 11-13128

COMSTOCK AND WESCOTT, INC., CAMBRIDGE, MASS.
11-4545

CONNECTICUT HARD RUBBER CO., NEW HAVEN.
11-5853 11-6701

CONNECTICUT, UNIV., STORRS.
11-1414

CONVAIR, FORT WORTH, TEX.
11-1559 11-1946
11-2161 11-2180
11-2181 11-2182
11-2183 11-3469
11-5027 11-5056
11-6161 11-6614
11-8891 11-9157
11-9431 11-10781
11-11300 11-11328
11-11329 11-11360
11-11471 11-13532

CORNELL AERONAUTICAL LAB., INC., BUFFALO.
11-307 11-323
11-328 11-1034
11-1051 11-1136
11-5344 11-11220

CORNELL UNIV., ITHACA, N. Y.
11-7976

CORNELL UNIV., ITHACA, N. Y. FLOYD NEWMAN LAB. OF NUCLEAR STUDIES.
11-9146

CORPS OF ENGINEERS, NORTH PACIFIC DIV. LAB., TROUTDALE, OREGON.
11-2418

CURTISS-WRIGHT CORP. PROPELLER DIV., CALDWELL, N. J.
11-1052

CURTISS-WRIGHT CORP. RESEARCH DIV., QUEHANNA, PENNA.
11-12726 11-13490

D

DAVID SARNOFF RESEARCH CENTER, PRINCETON, N. J.
11-1245 11-1247
11-1965 11-11301
11-11302

DAVID W. TAYLOR MODEL BASIN, APPLIED MATHEMATICS LAB., CARDEROCK, MD.
11-4930 11-8169

DAVID W. TAYLOR MODEL BASIN, CARDEROCK, MD.
11-456 11-3551
11-6417

DAYTON, OHIO, UNIV.
11-4493

DENVER AREA OFFICE, AEC.
11-1082 11-11191

DENVER, UNIV. DENVER RESEARCH INST.
11-4378 11-11088
11-11133

DETROIT ARSENAL, CENTER LINE, MICH.
11-1062

DETROIT, UNIV.
11-1201

DIAMOND ALKALI CO., CLEVELAND.
11-9858

DIAMOND ORDNANCE FUZE LABS., WASHINGTON, D. C.
11-12723

DIVISION OF BIOLOGY AND MEDICINE, AEC.
11-7040

DIVISION OF BIOLOGY AND MEDICINE. RADIATION INSTRUMENTS BRANCH, AEC.
11-11039

DIVISION OF NUCLEAR MATERIALS MANAGEMENT, AEC.
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DIVISION OF RAW MATERIALS, AEC.
11-4288

DIVISION OF RAW MATERIALS. DENVER EXPLORATION BRANCH, AEC.
11-4433 11-4434
11-4862 11-12734

DIVISION OF RAW MATERIALS. SALT LAKE EXPLORATION BRANCH, AEC.
11-6354 11-6355

DIVISION OF REACTOR DEVELOPMENT, AEC.
11-1026 11-3078
11-3558

DIVISION OF REACTOR DEVELOPMENT. ENGINEERING DEV. BRANCH, AEC.
11-5829

DIVISION OF REACTOR DEVELOPMENT. MARITIME REACTORS BRANCH, AEC.
11-12901

DIVISION OF RESEARCH, AEC.
11-3847 11-8926
11-13042 11-13824

DIVISION OF RESEARCH. CONTROLLED THERMONUCLEAR BRANCH, AEC.
11-12780

DOW CHEMICAL CO., MIDLAND, MICH.
11-3429 11-5349

DOW CHEMICAL CO. NUCLEAR RESEARCH LAB., MIDLAND, MICH.
11-8665

DOW CHEMICAL CO. ROCKY FLATS PLANT, DENVER.
11-5830 11-12509

DOW CHEMICAL CO. WESTERN DIV., PITTSBURG, CALIF.
11-183 11-981
11-982 11-1018
11-1427 11-2856
11-3755 11-4842
11-5256 11-7142
11-8864 11-13290

DOW CHEMICAL-DETROIT EDISON ASSOCIATES. ATOMIC POWER DEV. PROJECT, DETROIT.
11-5184 11-7135
11-11807 11-13989

DRIVER-HARRIS CO., HARRISON, N. J.
11-316

DU MONT ALLEN B. LABS., INC. TUBE RESEARCH LABS., PASSAIC, N. J.
11-1246 11-3464
11-5410 11-12107

DU PONT DE NEMOURS E. I. AND CO. ATOMIC ENERGY DIV., WILMINGTON, DEL.
11-8709 11-12593

DU PONT DE NEMOURS E. I. AND CO. ENGINEERING DEPT., WILMINGTON, DEL.
11-6661 11-7565

DU PONT DE NEMOURS E. I. & CO. EXPERIMENTAL STATION, WILMINGTON, DEL.
11-12466

DU PONT DE NEMOURS E. I. AND CO. JACKSON LAB., WILMINGTON, DEL.
11-8403 11-8428
11-10850 11-10851
11-11644 11-12381
11-12422 11-13009
11-13010 11-13689

DU PONT DE NEMOURS E. I. & CO. SAVANNAH RIVER LAB., AUGUSTA, GA.
11-648 11-769
11-923 11-983
11-984 11-1239
11-1240 11-1321
11-1977 11-2598
11-2900 11-3476
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11-12673 11-12795
11-12802 11-12883
11-12884 11-13049
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11-13605 11-13918
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DU PONT DE NEMOURS E. I. AND CO. TNX DIV. WILMINGTON, DEL.
11-7464 11-7566
11-8430 11-8440

DU PONT DE NEMOURS E. I. AND CO., WILMINGTON, DEL.
11-12382

E

EAGLE-PICHER RESEARCH LABS., JOPLIN, MO.
11-413

EDGERTON, GERMESHAUSEN AND GRIER, INC., BOSTON.
11-7243

EMORY UNIV., GA.
11-8191

ENGINEER SCHOOL LIBRARY, FORT BELVOIR, VA.
11-11013

ESSO RESEARCH AND ENGINEERING CO., LINDEN, N. J.
11-11109 11-11959

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH, GENEVA.
11-1356 11-4561
11-11255 11-11325
11-12109 11-13527

EVANS SIGNAL LAB., BELMAR, N. J.
11-734

F

FEDERAL CIVIL DEFENSE ADMINISTRATION, BATTLE CREEK, MICH.
11-1750 11-1751
11-1752 11-3275
11-7070 11-7922
11-9905

FEDERAL CIVIL DEFENSE ADMINISTRATION, WASHINGTON, D. C.
11-11830

FERGUSON H. K. CO. ATOMIC ENERGY DIV., NEW YORK.
11-11778

FERGUSON H. K. CO., NEW YORK.
11-2678 11-2711
11-2712 11-2713
11-2714 11-2715
11-2717 11-5575
FERTILIZER RESEARCH LAB., WASHINGTON, D. C.
11-13108
FLORIDA. UNIV., GAINESVILLE.
11-3179
FLORIDA. UNIV., GAINESVILLE. ENGINEERING & INDUSTRIAL EXPERIMENT STATION.
11-445 11-10511
FOOD & AGRI. ORG. OF THE UNITED NATIONS, ROME. EUROPEAN COMM. ON AGRI.
11-11903
FOOD AND DRUG ADMINISTRATION, WASHINGTON, D. C.
11-1752 11-3275
11-7070
FOOTE MINERAL CO., PHILADELPHIA.
11-7551
FORD INSTRUMENT CO., NEW YORK.
11-10165 11-11428
FORD MOTOR CO., DEARBORN, MICH.
11-13343 11-13344
11-13345
FOSTER WHEELER CORP., NEW YORK.
11-2282 11-9858
FRANCE. COMMISSARIAT A L ENERGIE ATOMIQUE, PARIS.
11-48 11-66
11-283 11-1081
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11-11051 11-13562
FRANKFORD ARSENAL, PITMAN-DUNN LABS., PHILADELPHIA.
11-921
FRANKLIN INST. LABS. FOR RESEARCH AND DEVELOPMENT, PHILADELPHIA.
11-1049 11-3425

G

GENERAL DYNAMICS CORP. ELECTRIC BOAT DIV., GROTON, CONN.
11-9477
GENERAL ELECTRIC CO. AIRCRAFT GAS TURBINE DIV., CINCINNATI.
11-13203 11-13204
GENERAL ELECTRIC CO. AIRCRAFT NUCLEAR PROPULSION DEPT., CINCINNATI.
11-254 11-3062
11-4074 11-5878
11-8024 11-8164
11-8664 11-10055
11-10065 11-10162
11-10163 11-10164
11-10174 11-12011
11-12874
GENERAL ELECTRIC CO. ATOMIC NUCLEAR PROPULSION DEPT., CINCINNATI.
11-13354
GENERAL ELECTRIC CO. ATOMIC POWER EQUIPMENT DEPT., SCHENECTADY, N. Y.
11-651
GENERAL ELECTRIC CO. ATOMIC PRODUCTS DIV., SCHENECTADY, N. Y.
11-3736
GENERAL ELECTRIC CO. GENERAL ENG. & CONSULTING LAB., SCHENECTADY, N. Y.
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GENERAL ELECTRIC CO. GENERAL ENGINEERING LAB., SCHENECTADY, N. Y.
11-451 11-452
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11-10649 11-12929
GENERAL ELECTRIC CO. HANFORD ATOMIC PRODUCTS OPERATION RICHLAND, WASH.
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GENERAL ELECTRIC CO., PITTSFIELS, MASS.
11-2258
GENERAL ELECTRIC CO. RESEARCH LAB., SCHENECTADY, N. Y.
11-1132 11-1524
11-2243 11-3426
11-3427 11-5855
11-10564
GENERAL ELECTRIC CO. SPEC. ELECTRONIC COMPONENTS DEPT., AUBURN, N. Y.
11-11242 11-11243
GENERAL ELECTRIC CO. SPEC. TRANSFORMER DEPT., FORT WAYNE, IND.
11-12791 11-12792
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GEOLOGICAL SURVEY.
11-3404 11-3406
11-3820 11-4436
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11-6357 11-7109
11-10084 11-11188
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GEORGIA INST. OF TECH., ATLANTA. ENGINEERING EXPERIMENT STATION.
11-5840 11-11179
11-11484
GIRDLER CORP. GAS PROCESSES DIV. PROCESS DEV & RESEARCH LABS., LOUISVILLE, KY.
11-13845
GOODRICH B. F. CO. RESEARCH CENTER, BRECKSVILLE, OHIO.
11-7360
GOODYEAR ATOMIC CORP., PORTSMOUTH, OHIO.
11-1322 11-6222
11-6458 11-8865
11-9267
GOULD-NATIONAL BATTERIES, INC., ST. PAUL, MINN.
11-4401 11-4402
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11-4405 11-6414
GRAHAM, CROWLEY, & ASSOC., INC., JENKINTOWN, PENNA.
11-2501 11-2502
11-2503 11-2504
11-2505
GRAND JUNCTION OPERATIONS OFFICE, AEC, COLO.
11-5306
GRAND JUNCTION OPERATIONS OFFICE. EXPLORATION DIV., AEC.
11-10083
GREAT LAKES CARBON CORP., MORGANTON, N. C.
11-1795
GREAT LAKES CARBON CORP., MORTON GROVE, ILL.
11-153 11-154
11-155 11-156
11-157 11-158
11-159 11-952
11-1795 11-7957
GT. BRIT. ARMAMENT RES. & DEV. EST., FORT HALSTEAD, KENT, ENGLAND.
11-483
GT. BRIT. ARMAMENT RES. ESTABLISHMENT, SEVEN OAKS, KENT, ENGLAND.
11-4449
GT. BRIT. ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, BERKS, ENGLAND.
11-46 11-235
11-236 11-269
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GT. BRIT. ATOMIC WEAPONS RESEARCH EST., ALDERMASTON, BERKS, ENGLAND.
11-5210 11-7108

GT. BRIT. CAPENHURST WORKS, CAPENHURST, CHES., ENGLAND.
11-1058 11-1221
11-1570 11-3774
11-4833 11-5779
11-9210 11-10058
11-13299

GT. BRIT. CULCHETH LABS., CULCHETH, LANCS, ENGLAND.
11-311 11-5333
11-7123 11-10458
11-11060 11-11140
11-12049 11-12930

GT. [illegible] DEPT. OF ATOMIC ENERGY, IND. GROUP H. Q., RISLEY, LANCS, ENGLAND.
11-3373 11-4878
11-12050

GT. BRIT. DOUNREAY WORKS, CAITHNESS, SCOTLAND.
11-6699

GT. BRIT. MIN. OF SUP. MAT. RES. DIV. HIGH EX. RES., FORT HALSTEAD, ENGLAND.
11-7176 11-7177
11-7178

GT. BRIT. NATIONAL GAS TURBINE EST., FARNBOROUGH, HANTS, ENGLAND.
11-12744

GT. BRIT. ROYAL AIRCRAFT ESTABLISHMENT, FARNBOROUGH, HANTS, ENGLAND.
11-160 11-277
11-319 11-4826
11-9388

GT. BRIT. WINDSCALE WORKS, SELLAFIELD, CUMB., ENGLAND.
11-4287 11-4686
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11-10443 11-10500
11-13309

H

HANFORD ENGINEER WORKS, GE NUCLEONICS PROJECT, RICHLAND, WASH.
11-7447

HANFORD ENGINEER WORKS, RICHLAND, WASH.
11-1493 11-9622
11-9836

HANFORD WORKS, RICHLAND, WASH.
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HARSHAW CHEMICAL CO., CLEVELAND.
11-9645 11-9646
11-9671 11-9674
11-9695 11-10852
11-12423 11-13701

HARVARD UNIV., BOSTON. AIR CLEANING LAB.
11-3886 11-6322

HARVARD UNIV., BOSTON. SCHOOL OF PUBLIC HEALTH.
11-7595 11-10123

HARVARD UNIV., CAMBRIDGE, MASS. CRUFT LAB.
11-9389

HARVARD UNIV., CAMBRIDGE, MASS. DUNBAR LAB.
11-7242

HAZELTON LABS., FALLS CHURCH, VA.
11-143

HOOKER ELECTROCHEMICAL CO., NIAGARA FALLS, N. Y.
11-5189 11-6368
11-9585 11-9586
11-9984 11-11912
11-12335 11-12336
11-13021 11-13594
11-13596

HORIZONS INC., CLEVELAND.
11-1131 11-2512
11-2513 11-2514
11-2515 11-2516
11-5896 11-7686
11-7687 11-8533
11-13096 11-13097

HYDROCARBON RESEARCH INC., NEW YORK.
11-3717

I

IDAHO OPERATIONS OFFICE, AEC.
11-9380

ILLINOIS INST. OF TECH., CHICAGO.
11-3832 11-4413
11-4461 11-8821

ILLINOIS INST. OF TECH., CHICAGO. ARMOUR RESEARCH FOUNDATION.
11-275 11-1121
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ILLINOIS. UNIV., URBANA.
11-106 11-209
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11-13233

ILLINOIS. UNIV., URBANA. DIGITAL COMPUTER LAB.
11-476 11-477
11-10160 11-10161

ILLINOIS. UNIV., URBANA. ELECTRICAL ENGINEERING RESEARCH LAB.
11-3874 11-4531
11-5053 11-6854
11-11296

ILLINOIS. UNIV., URBANA. ENGINEERING EXPERIMENT STATION.
11-4398 11-5378

IMPERIAL COLL. OF SCIENCE AND TECH., LONDON.
11-1038

INDIANA. UNIV., BLOOMINGTON.
11-3150 11-3170
11-3173

INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.
11-5244 11-5531
11-5755 11-9000

INTERNATIONAL MINERALS AND CHEMICAL CORP., CHICAGO.
11-930 11-988
11-5263 11-10037

INTERNUCLEAR CO., CLAYTON, MO.
11-225 11-481
11-628 11-629
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11-5910 11-10714
11-11389

IONICS, INC., CAMBRIDGE, MASS.
11-177 11-178
11-268 11-1072
11-1312 11-2353
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11-5029

IOWA STATE COLL., AMES.
11-1765 11-3155
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11-13787

IOWA STATE COLL., AMES. AGRICULTURAL EXPERIMENT STATION.
11-3650

IOWA STATE COLL., AMES. INST. FOR ATOMIC RESEARCH
11-3114 11-3117
11-3118

IOWA STATE UNIV., IOWA CITY.
11-3106 11-3133
11-3141 11-10124

ILLINOIS. UNIV., URBANA. ELECTRICAL ENGINEERING RESEARCH LAB.
11-3874 11-4531

J

JACKSON AND MORELAND ENGINEERS, NEW YORK.
11-2713

JAPAN. ATOMIC ENERGY RESEARCH INST.
11-3266

JOHNS HOPKINS UNIV., BALTIMORE.
11-2388 11-4113
11-4825 11-6276
11-11826

JOHNS HOPKINS UNIV., BALTIMORE. INST. FOR COOPERATIVE RESEARCH.
11-334 11-11685
11-13346

JOHNS HOPKINS UNIV., CHEVY CHASE, MD. OPERATIONS RESEARCH OFFICE.
11-8764

JOINT ESTABLISHMENT FOR NUCLEAR ENERGY RESEARCH, KJELLER, NORWAY.
11-986 11-1477
11-1980 11-3696
11-7906 11-8867
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11-11414 11-12231

K

KAISER ALUMINUM AND CHEMICAL CORP., SPOKANE.
11-5881 11-8924

KAISER ENGINEERS DIV., HENRY J KAISER CO., OAKLAND, CALIF.
11-651

KANSAS STATE COLL., MANHATTAN.
11-1272

KANSAS. UNIV.. KANSAS CITY. SCHOOL OF MEDICINE.
11-11020
KANSAS. UNIV.. LAWRENCE.
11-7930 11-8991
KELLEX CORP.. NEW YORK.
11-2757 11-3463
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KENTUCKY. UNIV.. LEXINGTON.
11-1140
KIDDE WALTER NUCLEAR LABS.. INC.. GARDEN CITY. N. Y.
11-9859 11-10915
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KNOLLS ATOMIC POWER LAB.. SCHENECTADY. N. Y.
11-226 11-594
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11-14035 11-14042
KOPPERS CO.. INC.. PITTSBURGH.
11-6321

L

LANGLEY AERONAUTICAL LAB.. LANGLEY FIELD. VA.
11-5884 11-6376
11-6738 11-8005
11-11205 11-13315
LEEDS AND NORTHRUP CO.. PHILADELPHIA.
11-4933
LEHIGH UNIV.. BETHLEHEM. PENNA. SURFACE CHEMISTRY LAB.
11-11918
LEIDEN. UNIVERSITEIT.
11-4015
LEVINTHAL ELECTRONIC PRODUCTS. INC.. REDWOOD CITY. CALIF.
11-11322 11-11323
LEWIS FLIGHT PROPULSION LAB.. CLEVELAND.
11-1065 11-2963
11-3388 11-4416
11-5338 11-5883
11-5885 11-8894
11-10517 11-10557
11-11163 11-11426
11-12722 11-12840
LIBRARY OF CONGRESS. TECHNICAL INFORMATION DIV.. WASHINGTON. D. C.
11-331 11-5872
11-6362 11-6691
11-11258
LINDE AIR PRODUCTS CO.. NEW YORK.
11-10827 11-12379
LINDE AIR PRODUCTS CO. TONAWANDA LAB.. TONAWANDA. N. Y.
11-8385 11-12383
LINDEN LABS.. INC.. STATE COLLEGE. PENNA.
11-3387
LIQUEFIED PETROLEUM GAS ASSN.. CHICAGO
11-9905
LITTLE ARTHUR D. INC.. CAMBRIDGE. MASS.
11-5308 11-6748
11-7320 11-13374
LITTLE ARTHUR D. INC WESTERN LABS.. SAN FRANCISCO.
11-989 11-990
11-991 11-1020
11-1021 11-6683
LOS ALAMOS SCIENTIFIC LAB.. N. MEX.
11-19 11-76
11-231 11-232
11-233 11-234
11-644 11-592
11-925 11-926
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11-13803 11-13840
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LOUISVILLE KY. UNIV. OF INDUSTRIAL RESEARCH.
11-2278
LOVELACE FOUNDATION FOR MED. ED. & RESEARCH. ALBUQUERQUE. N. MEX.
11-1393 11-1924
11-2773 11-2774
11-5128

M

MADISON SQUARE AREA. MANHATTAN DISTRICT. NEW YORK.
11-1772 11-5206
11-7564
MALLINCKRODT CHEMICAL WORKS. ST. LOUIS.
11-2389 11-2400
11-2401 11-2486
11-2814 11-7582
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11-7679 11-8281

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11-13013 11-13014
11-13016 11-13033
11-13034 11-13035
11-13036 11-13037
11-13038 11-13040
11-13041 11-13055
11-13222 11-13678
11-13679 11-13681
11-13688 11-13703

MALLORY-SHARON TITANIUM CORP., NILES, OHIO.
11-5347 11-6392

MANHATTAN DISTRICT, OAK RIDGE, TENN.
11-2831

MARITIME ADMINISTRATION, WASHINGTON, D. C.
11-12901

MARQUARDT AIRCRAFT CO., VAN NUYS, CALIF.
11-1515

MARTIN GLENN L. CO., BALTIMORE.
11-5667 11-5873
11-10975

MARYLAND. UNIV., COLLEGE PARK. INST. OF MOLECULAR PHYSICS.
11-539

MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
11-325 11-326
11-538 11-829
11-2248 11-2259
11-2275 11-4490
11-5055 11-6362
11-6742 11-6855
11-7668 11-8442
11-8493 11-8495
11-8752 11-9212
11-10869 11-11421
11-11690 11-12738
11-13959

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. CORROSION LAB.
11-6384

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. DEPT. OF METALLURGY.
11-1120 11-1130
11-3414 11-3784
11-4214 11-4861
11-6235 11-6236
11-6237 11-12093

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. DIV. OF INDUSTRIAL COOPERATION.
11-3792 11-3793

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. FUELS RESEARCH LAB.
11-7065

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. LAB. FOR INSULATION RESEARCH.
11-7985

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. LAB. FOR NUCLEAR SCIENCE.
11-1542 11-1981
11-5365 11-9186
11-12186

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. LEXINGTON PROJECT.
11-7961

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. METALLURGICAL PROJECT.
11-7680 11-7681
11-8515 11-8516
11-8517 11-8518
11-8519 11-8520
11-8521 11-12426
11-13804 11-13805

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. NUCLEAR ENGINEERING PROJECT.
11-11800

MASSACHUSETTS INST OF TECH., CAMBRIDGE. RADIOACTIVITY CENTER.
11-5179 11-12639
11-12979

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. RESEARCH LAB. OF ELECTRONICS.
11-6772 11-8025
11-1920 11-5369
11-13358

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. SEDGWICK LABS. OF SANITARY SCI.
11-1402 11-1841

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. SERVOMECHANISMS LAB.
11-2713

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. SOLID-ST. MOLECULAR THEORY GR.
11-11254

MASSACHUSETTS INST. OF TECH., OAK RIDGE, TENN. ENG. PRACTICE SCHOOL
11-2247 11-2248
11-2306 11-2425
11-2470 11-2490
11-2582 11-3873
11-3885 11-8424
11-8678 11-9706
11-9756 11-10966
11-11639 11-11640
11-11641 11-11642
11-12378 11-12569
11-12698 11-12870
11-13003 11-13008
11-13148

MASSACHUSETTS INST. OF TECH., WATERTOWN. DIV. OF INDUSTRIAL COOP.
11-2390

MASSACHUSETTS INST. OF TECH., WATERTOWN, MASS. MINERAL ENG. LAB.
11-2276 11-2277
11-2346 11-2347
11-2348 11-2349
11-2350 11-2351
11-2352 11-2391
11-2392 11-2393
11-2394 11-2395
11-2396 11-2397
11-7537 11-7538
11-7583 11-7584
11-9744 11-12385
11-13015

MATHIESON CHEMICAL CORP., BALTIMORE.
11-8821

MAX-PLANCK-INSTITUT FUR PHYSIK, GOTTINGEN.
11-6899 11-6900
11-6901 11-6902
11-6903 11-6904

MEDICAL COLL. OF VIRGINIA, RICHMOND.
11-11022

METAL HYDRIDES INC., BEVERLY, MASS.
11-8751 11-9745
11-12349 11-12436
11-13702

METAL HYDRIDES INC. CHEMICAL RESEARCH LAB., BEVERLY, MASS.
11-2399 11-12428
11-12429 11-13825

METALLURGICAL ADVISORY COMMITTEE ON TITANIUM.
11-7195

METALLURGY DEVELOPMENT ADVISORY COMMITTEE, AEC.
11-3428 11-13099
11-13808

MICHIGAN STATE UNIV., EAST LANSING.
11-4804

MICHIGAN UNIV., ANN ARBOR.
11-179 11-180
11-830 11-1013
11-1475 11-1764
11-3113 11-3131
11-3134 11-3136
11-3137 11-3146
11-3154 11-3168
11-3169 11-3274
11-5250 11-5336
11-5337 11-5961
11-6231 11-9982
11-11204 11-11911

MICHIGAN. UNIV., ANN ARBOR. ENGINEERING RESEARCH INST.
11-80 11-104
11-1415 11-2901
11-4381 11-4882
11-5184 11-5293
11-6328 11-6329
11-7135 11-8011

MICHIGAN. UNIV., ANN ARBOR. MICHIGAN MEMORIAL-PHOENIX PROJECT.
11-2630 11-8173

MIDWEST RESEARCH INST., KANSAS CITY, MO.
11-208

MIDWESTERN UNIVERSITIES RESEARCH ASSN., MADISON, WIS.
11-9145 11-9343
11-9498 11-9499
11-10136 11-10637
11-10638 11-10767
11-11253 11-11456
11-11457 11-12134
11-12279 11-12917
11-13528

MIDWESTERN UNIVERSITIES RESEARCH ASSN., URBANA, ILL.
11-716 11-1674
11-2971 11-2993
11-3105 11-3106
11-3107 11-3108
11-3109 11-3110
11-3111 11-3112
11-3113 11-3114
11-3117 11-3118
11-3119 11-3120
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11-3175 11-3176
11-3177 11-3178
11-3586 11-3587
11-4722 11-6555
11-6940 11-6941
11-7211 11-7343
11-7344 11-7345

MINE SAFETY APPLIANCES CO., CALLERY, PENNA.
11-65 11-78
11-227 11-313
11-1850 11-2889
11-3398 11-3783
11-3845 11-4407
11-4431 11-4920
11-5190 11-5298
11-5310 11-5406
11-6700 11-7164
11-10291 11-10510
11-11427 11-12669
11-12733 11-12897

MINE SAFETY APPLIANCES CO., PITTSBURGH.
11-1127

MINNESOTA. UNIV., MINNEAPOLIS.
11-1053 11-3852
11-5317 11-5345
11-6356

MINNESOTA. UNIV., MINNEAPOLIS. INST. OF TECH.
11-1122 11-9897

MINNESOTA. UNIV., MINNEAPOLIS. SCHOOL OF CHEMISTRY.
11-3009

MONSANTO CHEMICAL CO., DAYTON, OHIO.
11-2830 11-3370

MONSANTO CHEMICAL CO. PLASTICS DIV., SPRINGFIELD, MASS.
11-81

MOUND LAB., MIAMISBURG, OHIO.
11-213 11-458
11-1775 11-2245
11-2411 11-2469
11-4802 11-7594
11-8435 11-11646
11-11917 11-11979
11-12328 11-12386
11-12440 11-12441
11-13570 11-13595

N

NATIONAL BUREAU OF STDS. CRYOGENIC ENGINEERING LAB., BOULDER, COLO.
11-11989 11-12019
11-12052 11-12305

NATIONAL BUREAU OF STDS. NBS-AEC CRYOGENIC ENG LAB., BOULDER, COLO.
11-386 11-12743

NATIONAL BUREAU OF STDS. NBS-AEC ENGINEERING LAB., BOULDER, COLO.
11-12022 11-12110

NATIONAL BUREAU OF STDS. WASHINGTON, D. C.
11-133 11-260
11-443 11-1137
11-1789 11-1835
11-2875 11-3341
11-3728 11-3729
11-3730 11-3731
11-3732 11-3733
11-4823 11-4832
11-4914 11-5307
11-6375 11-7576
11-7694 11-7703
11-7706 11-10432
11-10433 11-10434
11-11998 11-12788
11-13699

NATIONAL LEAD CO., INC. RAW MATERIALS DEVELOPMENT LAB., WINCHESTER, MASS.
11-931 11-994
11-995 11-996
11-1022 11-1488
11-2832 11-3363
11-5265 11-5266
11-5782 11-6296
11-6684 11-7146
11-7147 11-8872
11-8873 11-9999
11-10480 11-10481
11-11980

NATIONAL LEAD CO. OF OHIO, CINCINNATI.
11-3420 11-3421
11-7422 11-7423
11-7424 11-7577
11-7578 11-7579
11-7669 11-7670
11-8414 11-8496
11-8497 11-8498
11-9270 11-9271
11-9594 11-9623
11-9712 11-9726
11-10502 11-10844
11-10892 11-12334
11-12488 11-12997
11-13053 11-13101
11-13589 11-13693
11-13791

NATIONAL LEAD CO. RAW MATERIALS DEVELOPMENT LAB., WINCHESTER, MASS.
11-3761 11-4289
11-4365 11-4366
11-4367 11-12705
11-12706 11-12707
11-12708 11-13293

NATIONAL RESEARCH CORP., CAMBRIDGE, MASS.
11-12493

NATIONAL RESEARCH COUNCIL. COMMITTEE ON NUCLEAR SCIENCE.
11-8075

NATIONAL RESEARCH COUNCIL. COMMITTEE ON THE HANDBOOK OF BIOLOGICAL DATA.
11-4222

NATIONAL RESEARCH COUNCIL. MATERIALS ADVISORY BOARD. 11-4881 11-8901 11-11202
NATIONAL RESEARCH COUNCIL OF CANADA. ATOMIC ENERGY PROJECT. CHALK RIVER, ONT. 11-6529
NAVAL BOILER AND TURBINE LAB., PHILADELPHIA. 11-5860
NAVAL ENGINEERING EXPERIMENT STATION, ANNAPOLIS. 11-1865 11-3810 11-3839
NAVAL ENGINEERING EXPERIMENT STATION. MECHANICAL LAB., ANNAPOLIS. 11-11161
NAVAL MEDICAL RESEARCH INST., BETHESDA, MD. 11-832 11-834
NAVAL ORDNANCE LAB., CORONA, CALIF. 11-3768 11-9985
NAVAL ORD. LAB., WHITE OAK, MD. 11-6377 11-6419 11-6534 11-7357 11-9107 11-10110 11-11171 11-11206
NAVAL ORDNANCE TEST STATION, INYOKERN CHINA LAKE, CALIF. 11-3911 11-5125 11-5763 11-6799
NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF. 11-9403
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO. 11-834 11-1222 11-1378 11-1403 11-1720 11-1762 11-1805 11-2776 11-2780 11-3481 11-3652 11-3675 11-3702 11-4218 11-4228 11-4249 11-4778 11-4783 11-5138 11-5732 11-5841 11-7359 11-8766 11-8794 11-8973 11-8982 11-10365 11-10398 11-10650 11-11024 11-11077 11-11087 11-11104 11-11260 11-11330 11-13228 11-13282
NAVAL RESEARCH LAB., WASHINGTON, D. C. 11-258 11-276 11-317 11-487 11-488 11-1077 11-1277 11-1344 11-1921 11-3478 11-4614 11-4883 11-4884 11-4955 11-5311 11-5888 11-6210 11-6749 11-6865 11-8008 11-8922 11-8960 11-9027 11-10537 11-10538 11-10562 11-10771 11-10772 11-11009 11-11010 11-11172 11-11186 11-11334 11-11447 11-11919 11-12068 11-12069 11-12652 11-13098
NAVY ELECTRONICS LAB., SAN DIEGO, CALIF. 11-6615
NEBRASKA. UNIV., LINCOLN. 11-5402 11-5436 11-5532
NEVADA. UNIV., RENO. MACKAY SCHOOL OF MINES. 11-2303
NEW BRUNSWICK LAB., AEC, N. J. 11-1429 11-2331 11-2398 11-5781 11-6258 11-8289 11-9589 11-9590 11-9596 11-10559 11-10808 11-10810 11-10811 11-10812 11-10813 11-10814 11-10830 11-10854 11-10858 11-12332 11-12340 11-12347 11-12348 11-12404 11-12405 11-12406 11-12971 11-13598 11-13599
NEW ENGLAND DEACONESS HOSPITAL. CANCER RESEARCH INST., BOSTON. 11-1392
NEW ENGLAND MATERIALS LAB., INC., MEDFORD, MASS. 11-318
NEW JERSEY. CERAMIC RESEARCH STATION, NEW BRUNSWICK. 11-11178
NEW MEXICO. UNIV., ALBUQUERQUE. 11-76 11-3325 11-6462 11-10035 11-10617 11-11839
NEW MEXICO. UNIV., ALBUQUERQUE. ENGINEERING EXPERIMENT STATION. 11-11319
NEW YORK OPERATIONS OFFICE, AEC. 11-51 11-11713 11-11714 11-13567
NEW YORK OPERATIONS OFFICE. HEALTH AND SAFETY LAB., AEC. 11-50 11-878 11-928 11-1244 11-1263 11-2413 11-3480 11-4795 11-6211 11-6656 11-6741 11-9203 11-9404 11-9508 11-9947 11-11842 11-11929
NEW YORK. STATE UNIV. COLL. OF CERAMICS, ALFRED. 11-954 11-6002 11-10523
NEW YORK UNIV., NEW YORK. 11-1178 11-1179 11-4488 11-11150 11-11151 11-11152 11-11153 11-11154
NEW YORK UNIV., NEW YORK. ATOMIC ENERGY COMMISSION COMPUTING FACILITY. 11-479 11-1234 11-1235 11-4563 11-5429 11-5430 11-6420 11-11317 11-12758
NEW YORK UNIV., NEW YORK. COLL. OF ENGINEERING. 11-1175 11-1581 11-4468 11-5384 11-6394 11-12869
NEW YORK UNIV., NEW YORK. INST. FOR MATHEMATICS AND MECHANICS. 11-6418
NEWPORT NEWS SHIPBUILDING AND DRY DOCK CO., VA. 11-13978 11-13979 11-13980
NORSK HYDROS INST. FOR CANCER RESEARCH, OSLO. 11-8806
NORTH AMERICAN AVIATION, INC., DOWNEY, CALIF. 11-541 11-1129 11-1326 11-2253 11-2300 11-2511 11-2719 11-2720 11-2721 11-2722 11-2723 11-3419 11-4094 11-4456 11-4457 11-4458 11-6533 11-6896 11-7441 11-7450 11-7541 11-7542 11-7543 11-7544 11-7545 11-7546 11-7547 11-7599 11-7693 11-7711 11-7842 11-7843 11-7844 11-7845 11-7846 11-7847 11-7848 11-7850 11-7851 11-7852 11-7853 11-7880 11-7888 11-7889 11-7904 11-8175 11-8310 11-8311 11-8312 11-8313 11-8321 11-8386 11-8387 11-8388 11-8389 11-8547 11-8685 11-8686 11-8687 11-8688 11-8689 11-8690 11-8691 11-8693 11-8694 11-8695 11-8696 11-8697 11-8698 11-8699 11-8700 11-8701 11-8702 11-8703 11-8704 11-8745 11-8746 11-8756 11-8757 11-9331 11-9464 11-9603 11-9611 11-9637 11-9638 11-9640 11-9725 11-9768 11-9769 11-9840 11-9841 11-9842 11-9843 11-9845 11-9846 11-9847 11-9848 11-9849 11-9850 11-9851 11-9852 11-9853 11-9854 11-9855 11-9856 11-9857 11-9894 11-9902 11-10289 11-10334 11-10909 11-10967 11-10968 11-10969 11-10970 11-10972 11-10976 11-11002 11-11425 11-11820 11-12331 11-12508 11-12575 11-12576 11-12577 11-12578 11-12579 11-12580 11-12581 11-12582 11-12590 11-12597 11-12602 11-12626 11-12975 11-12982 11-13172 11-13173 11-13174 11-13175 11-13176 11-13196 11-13220 11-13619 11-13620 11-13700 11-13963 11-13964 11-13965 11-13966 11-13967 11-13968 11-13970 11-13971 11-13972 11-13973 11-13974 11-13975 11-13976 11-13977 11-14021
NORTH AMERICAN AVIATION, INC., LOS ANGELES. 11-9839 11-11023 11-12427 11-12980 11-12981 11-13171 11-13208 11-13719
NORTH ATLANTIC TREATY ORG., PARIS. AD. GP. FOR AERO. RES. & DEV. 11-1505 11-1506
NORTH CAROLINA STATE COLL., RALEIGH. 11-1039 11-5222 11-11181 11-13331
NORTH CAROLINA STATE COLL., RALEIGH. SCHOOL OF ENG. 11-1316
NORTHWEST ELECTRODEVELOPMENT LAB., ALBANY, OREG. 11-10809 11-12333 11-13767 11-13768
NORTHWESTERN UNIV., EVANSTON, ILL. 11-4379 11-11078
NORTON CO., WORCHESTER, MASS. 11-9668
NORWAY. DEFENCE RESEARCH ESTABLISHMENT. 11-13246
NUCLEAR CROSS SECTIONS ADVISORY GROUP, AEC. 11-5535 11-8137 11-10247 11-13115 11-13116 11-13117 11-13858
NUCLEAR DEVELOPMENT ASSOCIATES, INC., WHITE PLAINS, N. Y. 11-6089 11-12444 11-12445 11-13857
NUCLEAR DEVELOPMENT CORP. OF AMERICA, WHITE PLAINS, N. Y. 11-1233 11-1268 11-1848 11-1849 11-2019 11-4543 11-5676 11-5835 11-5836 11-5837 11-6705 11-11460 11-13720
NUCLEAR METALS, INC., CAMBRIDGE, MASS. 11-3428 11-5339 11-5340 11-5886 11-6310 11-7683 11-7684 11-7949 11-8523 11-8524 11-9332 11-10090 11-10560 11-11710 11-11711 11-11715 11-12288 11-12489 11-12490 11-12491 11-13806
NUCLEAR POWER GROUP, CHICAGO. 11-12583

O

OAK RIDGE GASEOUS DIFFUSION PLANT, TENN. 11-412 11-987 11-2224 11-2886 11-3843 11-4393 11-4415 11-5404 11-5405 11-5428 11-8304 11-8986 11-8998 11-10456 11-10611 11-10631 11-11056 11-11249 11-11250 11-11251 11-12650 11-12698 11-12721 11-12789 11-12799 11-12803 11-13356 11-13377 11-13831 11-13832 11-13847 11-13853
OAK RIDGE INST. OF NUCLEAR STUDIES, INC., TENN. 11-6185
OAK RIDGE NATIONAL LAB., TENN. 11-52 11-182 11-186 11-214 11-237 11-238 11-308 11-309 11-310 11-318 11-484 11-552 11-638 11-639 11-640 11-641 11-642 11-643 11-644 11-645 11-646 11-653 11-813 11-904 11-929 11-963 11-975 11-978 11-979 11-980 11-1035 11-1036 11-1059 11-1074 11-1202 11-1212 11-1213 11-1214 11-1226 11-1227 11-1245 11-1247 11-1268 11-1315 11-1316 11-1318 11-1327 11-1373 11-1374 11-1430 11-1476 11-1509 11-1513 11-1541 11-1618 11-1656 11-1773 11-1776 11-1794 11-1799 11-1823 11-1824 11-1846 11-1847 11-1862 11-1863 11-1874 11-1875 11-1922 11-2105 11-2107 11-2108 11-2109 11-2110 11-2111 11-2112 11-2113 11-2122 11-2162 11-2231 11-2232 11-2239 11-2246 11-2260 11-2261 11-2262 11-2263 11-2279 11-2280 11-2284 11-2285 11-2288 11-2295 11-2296 11-2328 11-2329 11-2330 11-2332 11-2333 11-2334 11-2335 11-2336 11-2337 11-2338 11-2355 11-2356 11-2357 11-2383 11-2384 11-2408 11-2409 11-2410 11-2416 11-2417 11-2427 11-2428 11-2429 11-2430 11-2431 11-2458 11-2459 11-2460 11-2461 11-2462 11-2463 11-2500 11-2543 11-2556 11-2559 11-2581 11-2591 11-2597 11-2620 11-2621 11-2622 11-2631 11-2638 11-2639 11-2640 11-2641 11-2642 11-2643 11-2644 11-2645 11-2646 11-2647 11-2648 11-2649 11-2650 11-2651 11-2652 11-2653 11-2654 11-2655 11-2656 11-2657 11-2658 11-2659 11-2660 11-2661 11-2662 11-2663 11-2664 11-2665

11-2666 11-2667
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11-3809 11-3836
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OAK RIDGE NATIONAL LAB., Y-12 AREA, TENN.
11-2361 11-2362
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11-13762 11-13859
11-13871 11-14016

OAK RIDGE OPERATIONS OFFICE, AEC.
11-215

OAK RIDGE OPERATIONS OFFICE., FEED MATERIALS DIV., AEC.
11-1825

OAK RIDGE OPERATIONS OFFICE. RESEARCH AND DEVELOPMENT DIV., AEC.
11-6092

OAK RIDGE SCHOOL OF REACTOR TECHNOLOGY, TENN.
11-647 11-1317
11-2106 11-4006
11-4080 11-6075
11-7325 11-10108
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OHIO STATE UNIV., COLUMBUS.
11-3156 11-3159
11-3167

OHIO STATE UNIV. RESEARCH FOUNDATION, COLUMBUS.
11-77 11-302
11-329 11-906
11-908 11-1857
11-3904 11-5871

OKLAHOMA AGRICULTURAL AND MECHANICAL COLL., SCHOOL OF ELECT. ENG. STILLWATER.
11-8974 11-9345

OKLAHOMA AGRICULTURAL AND MECHANICAL COLL., STILLWATER.
11-1176 11-4285

OLIN MATHIESON CHEMICAL CORP., BALTIMORE.
11-77 11-906
11-907 11-1857
11-3699

OREGON. AGRICULTURAL EXPERIMENT STATION, CORVALLIS.
11-3651

OREGON. UNIV., EUGENE.
11-5859 11-7183
11-9980

OREGON. UNIV., PORTLAND. MEDICAL SCHOOL.
11-67 11-896

ORGANIZATION FOR EUROPEAN ECONOMIC CO-OPERATION, PARIS.
11-7330 11-11014

P

PACIFIC GAS & ELECTRIC CO., SAN FRANCISCO.
11-12596

PACIFIC NORTHWEST POWER GROUP, RICHLAND, WASH.
11-8710

PARSONS CORP., TRAVERSE CITY, MICH.
11-1047 11-1048

PARSONS RALPH M. CO., PASADENA, CALIF.
11-13732

PATTERSON, MOOS & CO., INC., LONG ISLAND CITY, N. Y.
11-1462

PENINSULAR CHEM. RESEARCH, INC., GAINESVILLE, FLA.
11-144

PENN-TEXAS CORP., NEW YORK.
11-814 11-5667
11-5703 11-10073

PENNSYLVANIA STATE COLL., UNIVERSITY PARK.
11-927 11-7223

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
11-11107

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK. COLL. OF CHEMISTRY AND PHYSICS.
11-207 11-955
11-968 11-2876
11-9213

PENNSYLVANIA STATE UNIV., UNIV. PARK. COLL. OF ENG. AND ARCHITECTURE.
11-4380 11-6535

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK. COLL. OF MINERAL INDUSTRIES.
11-4440 11-9986

PENNSYLVANIA STATE UNIV., UNIV. PARK. MINERAL INDUSTRIES EX. STATION
11-976 11-7190
11-12036

PENNSYLVANIA STATE UNIV., UNIV. PARK. PETROLEUM REFINING LAB.
11-910 11-4419
11-8826 11-12670

PENNSYLVANIA. UNIV., PHILADELPHIA.
11-6168 11-6169
11-8190

PERSONNEL AND TRAINING RES. CENTER. PERSONNEL LAB., LACKLAND AFB, TEX.
11-7048

PHILLIPS PETROLEUM CO. ATOMIC ENERGY DIV., IDAHO FALLS, IDAHO.
11-212 11-457
11-650 11-1232
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PHILLIPS PETROLEUM CO. ATOMIC POWER DIV., IDAHO FALLS, IDAHO.
11-4362 11-8673
11-8674 11-8675
11-8676 11-8677

PICATINNY ARSENAL, SAMUEL FELTMAN AMMUNITION LABS., DOVER, N. J.
11-5238 11-5963

PIONEER SERVICE AND ENGINEERING CO., CHICAGO.
11-9858

PITTSBURGH, UNIV.
11-314 11-2920
11-3423 11-4462
11-4820 11-5370
11-5776 11-10442
11-11079 11-11123
11-12511

PITTSBURGH, UNIV. SARAH MELLON SCAIFE RADIATION LAB.
11-3008 11-6864
11-12843

PLAX CORP., HARTFORD, CONN.
11-1413 11-1414

PRATT & WHITNEY AIRCRAFT DIV., UNITED AIRCRAFT CORP., HARTFORD, CONN.
11-1328 11-1882
11-7179

PRINCETON UNIV., N. J.
11-231 11-232
11-233 11-234
11-239 11-1749
11-3470 11-7942

PRINCETON UNIV., N. J. FORRESTAL RESEARCH CENTER.
11-6388

PRINCETON UNIV., N. J. FRICK CHEMICAL LAB.
11-2345 11-2371

PRINCETON UNIV., N. J. OBSERVATORY.
11-7374

PRINCETON UNIV., N. J. PALMER PHYSICAL LAB.
11-12783

PRINCETON UNIV., N. J. PROJECT MATTERHORN.
11-4527 11-5391
11-5392 11-5409
11-11285 11-11286
11-12098 11-12099

PUBLIC HEALTH SERVICE, WASHINGTON, D. C.
11-1026

PUBLIC SERVICE CO. OF NORTHERN ILL. CEPS GROUP, CHICAGO.
11-13128

PURDUE RESEARCH FOUNDATION, LAFAYETTE, IND.
11-2286 11-10329
11-11159 11-12916

PURDUE UNIV., LAFAYETTE, IND.
11-3138 11-3142
11-3151 11-7293
11-10060 11-11292

Q

QUANTUM INC., CHESHIRE, CONN.
11-5302

R

RADIATION, INC., MELBOURNE, FLA.
11-8076

RAND CORP., SANTA MONICA, CALIF.
11-549 11-793
11-3077 11-3272
11-3459 11-3643
11-3644 11-4492
11-4558 11-5427
11-6771 11-6800
11-6908 11-6975
11-8789 11-9344
11-11318 11-12135
11-13359

REACTION MOTORS, INC., DENVILLE, N. J.
11-12712

REACTOR SAFEGUARD COMMITTEE, AEC.
11-2634 11-2635

RENSSELAER POLYTECHNIC INST., TROY, N. Y.
11-11221

RENSSELAER POLYTECHNIC INST., TROY, N. Y. POWDER METALLURGY LAB.
11-2526 11-12500

RICHMOND, VA. UNIV.
11-5211 11-5777
11-6253 11-11080

RIO DE JANEIRO. CENTRO BRASILEIRO DE PESQUISAS FISICAS.
11-4975 11-5764
ROBERT A TAFT SANITARY ENGINEERING CENTER, CINCINNATI.
11-1026 11-6212
ROCHESTER, N. Y. UNIV.
11-1675 11-1964
11-4144 11-12817
ROCHESTER, N. Y. UNIV. ATOMIC ENERGY PROJECT.
11-109 11-826
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ROCHESTER, N. Y. UNIV., SCHOOL OF MEDICINE.
11-11876
ROCK ISLAND ARSENAL LAB., ILL.
11-12694
ROCKY MOUNTAIN NUCLEAR POWER STUDY GROUP, IDAHO FALLS, IDAHO.
11-821

S

SAINT LOUIS UNIV.
11-128
SALT LAKE AREA OFFICE, AEC.
11-3402 11-3403
11-4435 11-4863
11-7191 11-10539
SANDERSON AND PORTER, NEW YORK.
11-9093
SANDIA CORP., ALBUQUERQUE, N. MEX.
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SANTA FE OPERATIONS OFFICE, AEC.
11-1856
SAVANNAH RIVER OPERATIONS OFFICE, AEC.
11-3346
SCHOOL OF AVIATION MEDICINE, RANDOLPH AFB, TEXAS.
11-482 11-876
11-1395 11-3648
11-4332 11-10395
11-10396 11-10646
11-10647 11-11020
11-11876 11-12133
11-12640 11-12655
11-13230 11-13231
11-13232
SCHWARZKOPF DEVELOPMENT CORP., YONKERS, N. Y.
11-1119 11-3389
11-3412
SHARPLES CORP., PHILADELPHIA.
11-8627
SHELL DEVELOPMENT CO., EMERYVILLE, CALIF.
11-1184 11-4420
11-6282 11-6710
11-9211 11-11156
11-11157 11-11158
11-11958 11-12668
SHELL DEVELOPMENT CO., HOUSTON, TEX.
11-9386
SINTERCAST CORP. OF AMERICA, YONKERS, N. Y.
11-301 11-2912
SMITH E. H. AND CO., SILVER SPRING, MD.
11-4224
SOUTHERN CALIFORNIA EDISON CO., LOS ANGELES.
11-12872
SOUTHERN ILLINOIS UNIV., CARBONDALE.
11-1197
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
11-2925 11-3851
SPECIAL DEVICES CENTER, PORT WASHINGTON, N. Y.
11-459
STANDARD OIL CO. OF INDIANA, CHICAGO.
11-7444 11-7461
11-7463 11-8301
11-8556 11-9708
11-10904 11-11561
11-11579 11-11734
11-12354 11-13109
11-13573
STANDARD OIL CO. OF INDIANA, WHITING.
11-4266 11-7462
11-11155
STANDARD OIL DEVELOPMENT CO., ELIZABETH, N. J.
11-12403 11-13683
STANDARD OIL DEVELOPMENT CO. ESSO LABS., LINDEN, N. J.
11-1487
STANFORD RESEARCH INST., MENLO PARK, CALIF.
11-107 11-259
11-385 11-2964
11-3721 11-3876
11-5371 11-5808
11-8857 11-11108
11-12643 11-12692
11-13284
STANFORD UNIV., CALIF.
11-230 11-1609
STANFORD UNIV., CALIF. HIGH-ENERGY PHYSICS LAB.
11-2159 11-4918
STANFORD UNIV., CALIF. MICROWAVE LAB.
11-1354 11-11203
STEVENS INST. OF TECH., HOBOKEN, N. J.
11-7346
SWEDEN. RESEARCH INST. OF NATIONAL DEFENCE, STOCKHOLM.
11-13246
SYLVANIA ELECTRIC PRODUCTS INC. ATOMIC ENERGY DIV., BAYSIDE, N. Y.
11-1370 11-4463
11-4886 11-4887
11-6389 11-6390
11-9748 11-9749
11-11011 11-12402
11-12435 11-12448
11-12499 11-13807
SYLVANIA ELECTRIC PRODUCTS INC., BAYSIDE, N. Y.
11-1526 11-2525
11-7180 11-7685
11-8532 11-12434
11-12496 11-12497
11-12498 11-12589
SYRACUSE UNIV., N. Y.
11-1138
SYRACUSE UNIV., N. Y. METALLURGICAL RESEARCH LABS.
11-332
SYRACUSE UNIV., N. Y. RESEARCH INST.
11-336 11-904
11-1212 11-1213
11-1214 11-1541
11-5185 11-10566
11-10567 11-10568
11-12020

T

TECHNICAL INFORMATION SERVICE, AEC.
11-6093
TECHNICAL INFORMATION SERVICE EXTENSION, AEC.
11-992 11-1133
11-1525 11-2226
11-4849 11-5393
11-5592 11-5593
11-6695 11-7956
11-10049 11-12634
11-12656 11-12900
TECHNICAL OPERATIONS, INC., ARLINGTON, MASS.
11-10521
TECHNICAL RESEARCH GROUP, NEW YORK.
11-11346
TEMPLE UNIV., PHILADELPHIA. RESEARCH INST.
11-11247
TENNESSEE EASTMAN CORP., OAK RIDGE, TENN.
11-2372 11-2373
11-2375 11-2376
11-2377 11-2491
11-2584 11-13027
11-14038 11-14039
TENNESSEE. UNIV., KNOXVILLE.
11-2122 11-5134
11-7136 11-7137
11-11021 11-13181
TEXAS. AGRICULTURAL AND MECHANICAL COLL., COLLEGE STATION.
11-6443
TEXAS. UNIV., AUSTIN.
11-12640 11-13231
TEXAS. UNIV., AUSTIN. RADIOBIOLOGICAL LAB.
11-831 11-1394
11-6208 11-6469
11-9398 11-13230
TEXAS. UNIV., GALVESTON. TISSUE CULTURE LAB.
11-7908
TEXAS. UNIV., HOUSTON. M. D. ANDERSON HOSPITAL.
11-12655 11-12808
TEXAS. UNIV., HOUSTON. TUMOR INST.
11-12655 11-12808
TORONTO. UNIV. INST. OF AEROPHYSICS.
11-11165
TOUR SAN AND CO., INC., NEW YORK.
11-3385 11-3386
TRACERLAB, INC., BOSTON.
11-2 11-448
11-449 11-450
11-5733
TRIPARTITE NUCLEAR CROSS-SECTIONS COMMITTEE.
11-6509 11-6510
TUFTS UNIV., MEDFORD, MASS.
11-4394 11-5286
11-11059
TULANE UNIV., NEW ORLEANS.
11-9161

U

UNION CARBIDE AND CARBON RESEARCH LABS., NIAGARA FALLS, N. Y.
11-11967
UNION CARBIDE NUCLEAR CO. K-25 PLANT, OAK RIDGE, TENN.
11-8995 11-12870
11-13849
UNION CARBIDE NUCLEAR CO. PADUCAH PLANT, KY.
11-142 11-4393
UNION CARBIDE NUCLEAR CO. Y-12 PLANT, OAK RIDGE, TENN.
11-110 11-932
11-1023 11-1826
11-5217 11-6657
11-7935 11-12059
11-12800
UNITED AIRCRAFT CORP., HARTFORD, CONN.
11-1037
UNITED GLASS BOTTLE MANUFACTURERS, LTD., LONDON.
11-10450
UNITED KINGDOM ATOMIC ENERGY AUTH. IND. GROUP H. Q., RISLEY, LANCS, ENGLAND.
11-3073 11-7327
11-11413 11-12665
11-13302 11-13493
11-13494 11-13554
UNITED KINGDOM ATOMIC ENERGY AUTH. RES. GP., CHEM. DIV., WOOLWICH OUTSTA., ENG.
11-922 11-4283
11-6252 11-7066
11-13265
UNITED STATES VANADIUM CORP., URAVAN, COLO.
11-2302
UNIV. OF CALIFORNIA, RADIATION LAB., BERKELEY.
11-3459
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.
11-3368 11-7088
11-11058
UPPSALA. UNIV.
11-6545
UTAH. UNIV., SALT LAKE CITY.
11-2777 11-3806
UTAH. UNIV., SALT LAKE CITY. COLL. OF MEDICINE.
11-47 11-1724
11-2778 11-7909
11-11840
UTAH. UNIV., SALT LAKE CITY. INST. FOR THE STUDY OF RATE PROCESSES.
11-315 11-909
11-1180 11-2916
11-3766 11-4432
UTAH. UNIV., SALT LAKE CITY. RADIOBIOLOGY LAB.
11-5133 11-11019

V

VANDERBILT UNIV., NASHVILLE.
11-3028
VICTOREEN INSTRUMENT CO., CLEVELAND.
11-486 11-4491
11-4570
VIRGINIA-CAROLINA CHEMICAL CORP., RICHMOND.
11-4364
VIRGINIA. UNIV., CHARLOTTESVILLE. ORDNANCE RESEARCH LAB.
11-335
VITRO CORP. OF AMERICA, NEW YORK.
11-7700 11-7835
11-7836 11-7837
11-8280 11-8381
11-8382 11-8383
11-8514 11-9629
11-9630 11-9631
11-9632 11-9633
11-11571 11-11631
11-11632 11-11633
11-11634 11-11635
11-11798 11-12756
11-13007 11-13675
11-13676 11-13677
11-13698
VITRO LABS., WEST ORANGE, N. J.
11-1882 11-4430
11-4880 11-5024
11-7536 11-7838
11-8009 11-9255
11-10429 11-10473
11-11572 11-11573
11-11636 11-11637
11-11638 11-11662
11-13093 11-13951
VITRO MFG. CO., PITTSBURGH.
11-1478 11-1479
11-1480 11-1481
11-1482 11-1483
11-1484 11-1485
11-1486 11-1812

11-1813 11-1814
11-1815 11-1816
11-1817 11-1818
11-1819 11-1820
11-1821 11-9691
11-9692 11-9700
11-12394

W

WASHINGTON, UNIV., SEATTLE. APPLIED FISHERIES LAB.
11-4250 11-4261
11-5965 11-9192
WASHINGTON, UNIV., SEATTLE. SCHOOL OF MEDICINE.
11-10394
WASHINGTON UNIV., ST. LOUIS.
11-3890 11-8740
11-10105
WASHINGTON UNIV., ST. LOUIS. SCHOOL OF ENGINEERING.
11-8741 11-13203
11-13204
WASTE PROCESSING COMMITTEE, AEC.
11-2407 11-8888
11-12453
WATERTOWN ARSENAL LAB., MASS.
11-1528 11-4469
11-5350 11-5765
11-10091 11-11225
11-12675 11-13347
WAYNE ENGINEERING RESEARCH INST., DETROIT.
11-11164
WAYNE UNIV., DETROIT.
11-253 11-2971
11-3122 11-3123
11-3124 11-3125
11-3130
WELL INSTRUMENT DEVELOPING CO., BELLAIRE, TEX.
11-8913
WESTERN GEAR WORKS, LYNWOOD, CALIF.
11-5325
WESTERN RESERVE UNIV., CLEVELAND. INORGANIC RESEARCH LAB.
11-73
WESTINGHOUSE ELECTRIC CORP. ATOMIC POWER DIV., IDAHO FALLS, IDAHO.
11-12516
WESTINGHOUSE ELECTRIC CORP. ATOMIC POWER DIV., PITTSBURGH.
11-74 11-75
11-177 11-178
11-240 11-268
11-278 11-337
11-489 11-654
11-655 11-656
11-1054 11-1072
11-1078 11-1121
11-1185 11-1312
11-1329 11-1330
11-1375 11-1870
11-1984 11-2124
11-2125 11-2453
11-2454 11-2455
11-2456 11-2457
11-2466 11-2467
11-2487 11-2488
11-2489 11-2527
11-2528 11-2529
11-2530 11-2531
11-2532 11-2533
11-2534 11-2535
11-2536 11-2537
11-2538 11-2541
11-2542 11-2547
11-2548 11-2549
11-2550 11-2593
11-2594 11-2595
11-2612 11-2613
11-2614 11-2619
11-2728 11-2729
11-2730 11-2731
11-2732 11-2733
11-2734 11-2735
11-2752 11-2753
11-2760 11-2768
11-2772 11-2926
11-3079 11-3380
11-3780 11-3800
11-3801 11-3815
11-3854 11-3913
11-3959 11-4008
11-4101 11-4408
11-4900 11-5029
11-5223 11-5677
11-6330 11-6331
11-7265 11-8536
11-8537 11-8538
11-8539 11-8540
11-8711 11-8712
11-8714 11-8715
11-8716 11-8717
11-8718 11-8719
11-8720 11-9669
11-9751 11-9758
11-9765 11-9875
11-9876 11-9877
11-9878 11-10061
11-10062 11-10063
11-10295 11-10520
11-10569 11-10738
11-10740 11-10871
11-10881 11-10900
11-10918 11-10974
11-10979 11-10980
11-10982 11-10983
11-10984 11-10986
11-10987 11-10989
11-10991 11-10993
11-11012 11-11038
11-11166 11-11167
11-11226 11-11227
11-11433 11-11435
11-11649 11-11664
11-11667 11-11685
11-11686 11-11716
11-11720 11-11721
11-11722 11-11723
11-11724 11-11725
11-11726 11-11806
11-11808 11-11811
11-11812 11-11825
11-11960 11-12023
11-12437 11-12502
11-12511 11-12520
11-12603 11-12606
11-12607 11-12610
11-12902 11-13056
11-13102 11-13103
11-13104 11-13111
11-13188 11-13223
11-13508 11-13509
11-13600 11-13601
11-13705 11-13721
11-13722 11-13729
11-13730 11-13739
11-13755 11-13756
11-13757 11-13758
11-13759 11-13760
11-13761 11-13809
11-13810 11-13811
11-13812 11-13813
11-13814 11-13815
11-13816 11-13817
11-13818 11-13819
11-13820 11-13821
11-13822 11-13823
11-13839 11-13990
11-13991 11-13992
11-13996 11-13997
11-13998 11-13999
11-14000 11-14001
11-14002 11-14003
11-14004 11-14007
11-14009 11-14010
11-14011 11-14012
11-14013 11-14014
WESTINGHOUSE ELECTRIC CORP. AVIATION GAS TURBINE DIV., KANSAS CITY, MO.
11-3831
WESTINGHOUSE ELECTRIC CORP. BETTIS PLANT, PITTSBURGH.
11-166 11-228
11-1050 11-1063
11-1073 11-1141
11-1269 11-1270
11-1311 11-1363
11-1507 11-1575
11-1582 11-2123
11-2126 11-2736
11-3080 11-3400
11-3794 11-3945
11-4099 11-4100
11-4102 11-4214
11-4267 11-4765
11-4890 11-5030
11-5031 11-5264
11-5299 11-5303
11-5432 11-5594
11-5595 11-5596
11-5846 11-6094
11-6332 11-6333
11-6351 11-6444
11-6463 11-6721
11-6801 11-6802
11-6909 11-6910
11-7259 11-7260
11-7331 11-7361
11-7384 11-8178
11-8179 11-8534
11-8713 11-8721
11-8535 11-9108
11-9109 11-9391
11-9480 11-10071
11-10294 11-10296
11-10297 11-10298
11-10299 11-10300
11-10301 11-10639
11-10640 11-10641
11-10683 11-10737
11-10739 11-10902
11-10994 11-11177
11-11187 11-11430
11-11431 11-11432
11-11434 11-11436
11-11587 11-11717
11-11718 11-11719
11-11731 11-11810
11-11813 11-11814
11-11815 11-12000
11-12028 11-12057
11-12058 11-12242
11-12243 11-12244
11-12245 11-12446
11-12501 11-12510
11-12604 11-12605
11-12608 11-12609
11-12611 11-12612
11-12613 11-12614
11-12627 11-12676
11-12677 11-12751
11-12752 11-12753
11-12806 11-12896
11-12903 11-13118
11-13189 11-13306
11-13323 11-13507
11-13510 11-13993
11-13994 11-13995
11-14005 11-14006
11-14008 11-14032
WESTINGHOUSE ELECTRIC CORP., CHESWICK, PENNA.
11-1049
WESTINGHOUSE ELECTRIC CORP. COMMERCIAL ATOMIC POWER, PITTSBURGH.
11-5033 11-7167
11-10302 11-10303
11-12246 11-12247
WESTINGHOUSE ELECTRIC CORP. INDUSTRIAL ATOMIC POWER GROUP, PITTSBURGH.
11-1028 11-1040
11-1042 11-1061
11-1331 11-6537
11-7865 11-11462
WESTINGHOUSE ELECTRIC CORP. IND. ATOMIC POWER SECT., MCKEESPORT, PENNA.
11-1041 11-1332
11-4215 11-14015
WESTINGHOUSE ELECTRIC CORP., LAMP DIV., BLOOMFIELD, N. J.
11-2368
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH.
11-11804
WESTINGHOUSE ELECTRIC CORP. RESEARCH LABS., EAST PITTSBURGH, PENNA.
11-1050 11-1311
11-3592 11-4466
11-6856 11-12284
WHITE SANDS PROVING GROUND. ELECTRO-MECHANICAL LABS., N. MEX.
11-4504
WISCONSIN ALUMNI RESEARCH FOUNDATION, MADISON.
11-1723
WISCONSIN, UNIV., MADISON.
11-3135 11-3144
11-5761 11-6631
11-7402
WISCONSIN, UNIV., MADISON. NAVAL RESEARCH LAB.
11-6633 11-7237
WOLVERINE TUBE DIV., CALUMET AND HECLA, INC., DETROIT.
11-6329
WRIGHT AIR DEV. CENTER. AERO MEDICAL LAB., WRIGHT-PATTERSON AFB, OHIO.
11-8076
WRIGHT AIR DEV. CENTER. AERO. RES. LAB., WRIGHT-PATTERSON AFB, OHIO.
11-3703 11-5490
11-5892
WRIGHT AIR DEV. CENTER. ELECT. COMP. LAB., WRIGHT-PATTERSON AFB, OHIO.
11-3205 11-3597
11-11474
WRIGHT AIR DEV. CENTER. MATERIALS LAB., WRIGHT-PATTERSON AFB, OHIO.
11-330 11-964
11-1432 11-2924
11-3206 11-3342
11-3849 11-3958
11-4741 11-4742
11-4851 11-5861
11-5893 11-6150
11-6675 11-7981
11-10177 11-10465
11-10519 11-10588
11-11223 11-12812
WRIGHT AIR DEV. CENTER. POWER PLANT LAB., WRIGHT-PATTERSON AFB, OHIO.
11-6944
WRIGHT AIR DEV. CENTER. WRIGHT-PATTERSON AFB, OHIO.
11-10651 11-11089
WYANDOTTE CHEMICALS CORP., WYANDOTTE, MICH.
11-10042

Y

YALE UNIV., NEW HAVEN.
11-1638 11-12380
11-13353
YALE UNIV., NEW HAVEN. SLOANE PHYSICS LAB.
11-6493 11-7702
YALE UNIV., NEW HAVENS. STERLING CHEMISTRY LAB.
11-13632
YANKEE ATOMIC ELECTRIC CO., BOSTON.
11-4694 11-5032
11-5033 11-6095
11-10303 11-12246
11-12247

Z

ZURICH, UNIVERSITAT.
11-4782

SUBJECT INDEX FOR VOLUME 11

The user of this subject index should bear in mind that subjects, rather than words, have been indexed. The indexer tries to select what to him seems to be the most probable and logical place to look for the information under consideration. Since it is not possible to know exactly where users of the index might look for certain items of information, numerous cross references are included to guide the user to other sources of information on related subjects. Thus, the user must decide what the indexer would consider to be the most appropriate index entries for specific items of information. This problem, however, is inherent in the preparation and use of any subject index and is not, in any sense, peculiar to the index of *Nuclear Science Abstracts*.

Generally, the direct form of subject entry is used in this index rather than inverted headings or, in some cases, subheadings; e.g., Amino acids rather than Acids, amino; Helium isotopes He^4 rather than Helium—isotopes He^4 or Helium—He^4 isotopes. Note, however, that in some cases modifying terms are used parenthetically in preference to using a more direct type of entry which would result in the scattering of information; e.g., Sodium (liquid) rather than Liquid sodium. Organic compounds, on the contrary, are usually entered in the index in the inverted form so that substituted compounds are listed near the parent compound, e.g., Benzene, bromo- rather than Bromobenzene. In general, the style of nomenclature used is that of Chemical Abstracts except that some items listed there as subheadings are elevated to form part of the main heading, e.g., Butyric acid, ethyl esters rather than Butyric acid—ethyl esters. Salts of organic acids are indexed in a similar fashion.

Inorganic compounds are indexed in the direct form, listing cations in the order of increasing valence in the case of polycationic salts of varying valence and in alphabetic order for polycationic salts in which all cations have the same valence; e.g., Sodium aluminum sulfates and Potassium sodium sulfates.

In general, any one specific item of information is indexed only one place, and cross references are supplied at other possible index points; e.g., multi-component systems, such as alloys, are entered only once with the components arranged in alphabetical order, but see references are entered for the other arrangements of the components. A study of the effects of x radiation on hair will be indexed under both X RADIATION and HAIR. However, the information will not be indexed under the experimental animal, e.g., RATS, unless the report compares the effects on rat hair with the effects on the hair of other animals. Broad general headings are used only for broad general information. A paper on the treatment of thyroid disease with I^{131} will be indexed under THYROID DISEASES and under IODINE ISOTOPES I^{131}, but not under RADIOTHERAPY.

Main headings are listed in alphabetic order. A parenthetic qualifier following a main heading is disregarded in alphabetizing unless there is more than one so that the modifier determines the order; e.g., Sodium, Sodium (gaseous), Sodium (liquid), Sodium acetates.

Descriptive phrases (modifiers) rather than ordinary subheadings are used under the main headings to give a better indication of the material covered in an abstract than would be possible with only a word or two. Such phrases are written so that the idea considered most important is presented first, if this does not result in too awkward an expression. However, in searching the index it is advisable to scan all the modifiers under a main heading in order to determine which abstracts should be consulted for the desired information. Many of the modifiers are designed to be read in inverted order or to be read with the main heading inserted at the position of the comma in order to obtain a meaningful phrase; e.g., Uranium—allotropic transformation temperatures of, effect of cooling rate on is read "effect of cooling rate on allotropic transformation temperatures of uranium." Experience in using an index of this type will be the best guide in obtaining the desired information, and a consideration of synonymous, or nearly synonymous, terms will prove valuable.

The number preceding the colon is the volume number, and the number following the colon is the abstract number. The designation (R) following an abstract number indicates that it is an abstract of a progress report; the designation (J) indicates that it is an abstract of a journal (published literature) article; and the designation (P) indicates that it is an abstract of a patent. Abstract numbers for reports other than progress reports carry no letter designations.

SUBJECT INDEX FOR VOLUME 11

A

A-1 Reactor
See Food irradiation facilities.

A1W
See Carrier Vessel Reactor.

A2W
See Carrier Vessel Reactor.

Abdomen
penetrability, by glass missiles fragmented by atomic explosions, 11: 2773

Absorption
(See also Adsorption; Pulmonary absorption; Sorption.)
effect of non-absorbing reflector on resonance, 11: 8541(R)
specific radiation, capacity and apparatus for determining, 11: 3639(P)

Absorption cross sections
See Gamma absorption cross sections; X-ray absorption cross sections.

Absorption spectra
(See also specific spectra, e.g., Neutron spectra.)
band structure and mean life of admixture centers, theory, 11: 799(J)
of methanol, ethanol, and acetone, 11: 1805
of solids, radiation effects, 11: 1922(R)

Abstracts
on liquid metals technology, 11: 3845, 10510

Accelerator targets
See Materials testing accelerator targets; Radiation targets.

Accelerator tubes

Accelerators
(See also specific accelerators, e.g., Betatrons; Bevatron.)
auxiliary equipment for accelerating charged heavy ions, 11: 9559(P)
beam characteristics, 11: 3185(J), 4016(R), 13229(R)
beam current measurement, probe design, 11: 7029(P)
beam extractor design for, 11: 9566(P)
betatron oscillations, 11: 2158(J), 3185(J)
circular, review, 11: 2157(J)
commercial applications, economic aspects, 11: 10028(J), 12756
design, principles, performance and description, 11: 3880(J)
design and theory, Moscow conference on, 11: 6181(J), 10769(J)
design and use, 11: 2775(J)
design of electron, with preliminary collection, 11: 3181(J)
design of 50- to 60-Bev strong-focusing, 11: 3185(J), 5645(J)
design of fixed-field alternating-gradient, 11: 1362(J)
design of high-energy, 11: 3185(J)
design of isochronous, constant betatron frequencies, 11: 3185(J)
design of multielectrode system for charged particle acceleration in cascade phasotron, 11: 11459(J)

Accelerators (cont'd)
design of Pakistan, 11: 591(J)
design of proton ring, at 7 Bev, 11: 3185(J)
design of relativistic electron bunching, and generation of 1 to 0.1 mm waves using, 11: 5053
development, 11: 12(R), 15(J), 4487(R), 7345(R), 12279(R)
diverging electrostatic lenses for, 11: 4138(J)
electron motion in cyclic, stability, 11: 5646(J)
electronic areas for use with, advantages and limitations, 11: 1983
energy modulator for wider energy range at full resolution, 11: 5054(J)
evaluation of electron guide-field, 11: 12068(R)
fixed-field, linear equations of motion and tune, 11: 9145
focusing, phenomena in imperfection resonances, 11: 4016(R)
ion sources, high current injector for, 11: 3591(J)
ion sources, polarized, 11: 13527
lithium ion sources for, development, 11: 5640(J)
magnetic fields, 11: 719(J), 3148, 5366
measurement of inductive reactance vs. effective resistance in resonant cavities, 11: 5107(P)
numerical calculations for proton, 11: 6554
operation and development of University of California Radiation Laboratory, 11: 8549(R)
operation of Argonne National Laboratory low-voltage, 11: 11739(R)
particle extraction by regenerative method, 11: 4137(J)
phase transition in alternating gradient, 11: 3185(J)
program at Oak Ridge National Laboratory, 11: 9879
properties of electron, 11: 3185(J)
properties of intersecting beams in, 11: 3185(J)
proton beams, simultaneous focusing and acceleration, 11: 6128
r-f acceleration in fixed field, 11: 3185(J)
radiational losses in cyclic, 11: 4141(J)
regenerative action in high-energy, 11: 3185(J)
spark phenomena and rf decay in Livermore, 11: 13838(R)
strong focusing modification, 11: 3263(P)
studies at A.E.R.E. Harwell, 11: 3185(J)
target box design, 11: 5638(J)
target positioner for, 11: 11545(P)
theory of fixed-field alternating-gradient, 11: 731(J)
transition energy in strong focusing, effect of proximity of external resonance on, 11: 4142(J)
twist resonances in, theory, 11: 6130
variable-energy, beam focusing, 11: 5635(J)

Accelerometers
design of acceleration sensing and integrating device, 11: 7022(P)

Accidents
See Disasters.

Accounting
See SF materials accounting.

Acetamide
preparation of C^{14}-labeled, 11: 7977

Acetate Separation Process
extraction and decontamination of Pu in, 11: 11620(R)

Acetates
(See also Rare earth acetates; Sodium acetates.)
metabolism in rats, tracer study, 11: 66

Acetic acid
crystal structure, 11: 5385
1-naphthalene-, γ-C^{14}, preparation, 11: 9591(R)
preparation of C^{14}-labeled, 11: 7977, 8282(R)
radioinduced oxidation of solutions, 11: 2848(J), 4227(R)
radiolysis of aqueous solutions, 11: 11574(R)
vinylation of, hydrogen exchange and isotope effect on, 11: 13260(J)

Acetic acid, dichloro-
polarographic determination in mixtures of chloroacetic acids, 11: 927

Acetic acid, (ethylenediamine)tetra-
analytical uses in chromatographic separation on Rb and Cs, 11: 10482(J)
chelation with inorganic ions, chemical factors and industrial applications, 11: 917(J)
eluting agent in rare-earth separation by ion exchange, 11: 195(J)
therapeutic uses in radioelement poisoning, 11: 893

Acetic acid,(ethylenediamine)tetra-, calcium salts
chelating behavior for rare earths and yttrium deposited in rats, 11: 9191(J)
radiosensitivity effects in yeast, 11: 11877(R)
therapeutic effects alone and with Vitamin A in radium poisoning, 11: 1760(J)

Acetic acid, (ethylenediamine)tetra-, complexes
with iron and cobalt, charge transfer rates, 11: 916(J)
with molybdenum, molecular structure, 11: 957(J)

Acetic acid, (ethylenediamine)tetra-, sodium salts
corrosive effects on Ni and Ni alloys, 11: 8379

Acetic acid, iminodi-
derivatives, bibliography, 11: 917(J)
derivatives, properties, and analytical, biological, and industrial applications, 11: 917(J)

Acetic acid, nitrilotri-
chelation with inorganic ions, chemical factors and industrial applications, 11: 917(J)

Acetic acid, trichloro-
polarographic determination in mixtures of chloroacetic acids, 11: 927

Acetic acid, triphenyethyl esters
molecular rearrangements, 11: 9587(R)

Acetic acid, vinyl ester
polymerization by high energy radiation, 11: 1768(J)

Acetic acid–benzene, methyl-–water systems
phase studies, 11: 13597(R)

Acetic acid–benzene, nitro-–water systems
phase studies, 11: 13597(R)

Acetic acid–carbon tetrachloride–water systems
phase studies, 11: 13597(R)

Acetic acid–chloroform–water systems
phase studies, 11: 13597(R)

Acetic acid–isopropyl ether–water systems
phase studies, 11: 13597(R)

Acetic acid–2-pentanone, 4-methyl-–water systems
phase studies, 11: 13597(R)

Acetone
differentiating titration of phenols, carboxylic acids, enols, imides, and sulfonamides in, using tetra-alkyl ammonium hydroxide, 11: 8846(J)
preparation of C^{14}-labeled, 11: 7977

Acetone, thenoyltrifluoro-
solvent properties for Ce, Y, Zr, Nb, and Ru, 11: 7969
solvent properties for Pu, 11: 13023, 13296(J)
spectrophotometric determination in xylene, 11: 8296(R)

Acetylacetonates
solvent extraction behavior with UO_2^{2+}, Cu^{2+}, Pb^{2+}, and Bi^{3+}, 11: 3763(J)

Acetylene
dissociations in mass spectrum, 11: 3935(R)
ionization of mixtures of gases by Pu^{239} α particles, 11: 6677(J)
radiolysis with α particles, 11: 11576(R)
removal from air by adsorption on silica gel, 11: 5257(J)

Acid fluorides
See specific acid fluorides, e.g., Ammonium acid fluorides; Cesium acid fluorides.

Acid systems
See specific acid systems, e.g., Boric acid systems; Hydrochloric acid systems.

Acids
(See also specific acids, e.g., Carbonic acids; Fatty acids.)
acid constants of dibasic, 11: 7692(R)
application in radiochemical separations, 11: 5196(J)
determination in hydrolyzable ion solutions, 11: 1428
ion exchange separation of weak and strong, 11: 9587(R)

ACME-1
See Critical assemblies.

Acoustics
See Noise; Sound.

Acrylamide
polymerization in aqueous solutions by x- and γ-ray initiated reaction, 11: 6278(J), 6279(J)

Acrylic acid, methyl ester polymers
radiation effects, 11: 4350(J), 5246, 9656(J)
thermal capacity, 11: 4817
vacuum forming properties of, 11: 4850

ACTH
See Adrenocorticotropic hormone.

Actinide compounds
ion exchange of thiocyanate complexes, 11: 5249(J)
magnetic susceptibility, 11: 13577(R)

Actinides

(See also specific elements.)

chemical properties, 11: 9591(R)

ion-exchange separation by elution with ammonium α-hydroxy isobutyrate, 11: 1003(J)

solvent extraction behavior, 11: 9578(R)

Actinium

(See also Actinides.)

determination in radioactive ore, 11: 2839(J)

emission spectra, 11: 8019(J)

Actinium isotopes

(Isotopes identified by synonyms are indexed as in the table below.)

For	See
AcA	Polonium isotopes Po^{215}
AcB	Lead isotopes Pb^{211}
AcC	Bismuth isotopes Bi^{211}
AcC′	Polonium isotopes Po^{211}
AcC″	Thallium isotopes Tl^{207}
AcD	Lead isotopes Pb^{207}
AcK	Francium isotopes Fr^{223}
AcU	Uranium isotopes U^{235}
AcX	Radium isotopes Ra^{223}
RdAc	Thorium isotopes Th^{227}

thermal neutron cross sections, review, 11: 10245

Actinium isotopes Ac^{228}

beta decay energy, 11: 12341(R)

Actinium isotopes Ac^{227}

half life by calorimetric method, 11: 9003(J)

Activated carbon

See Carbon (activated).

Activation analysis

(See also Radiometric analysis.)

application in determination of impurities in high-purity metals, 11: 210(J)

applications of neutron capture reaction of U^{238} on irradiation, and fission of U^{235}, comparison of results, 11: 13266

data processing using IBM 650 digital computer, 11: 10636

gamma counting techniques in, 11: 12973(R)

of muscle tissue for Na, K, and P, 11: 4315(J)

neutron source preparation, 11: 1475(R)

principles and procedures, 11: 1716(P), 1776, 1980, 2260, 2263, 3707(J), 9592

Activation cross sections

See Neutron activation cross sections.

Activation of targets

See Radiation targets.

Addition compounds

formation and structure, 11: 956(J)

Adenylpyrophosphatase

activity in radiation sickness, 11: 3671(J)

Adhesion

testing, 11: 5302

testing of bond strength of Cr deposition on steel, 11: 335

Adhesives

(See also Ceramic binders.)

Adhesives (cont'd)

bonding and use as protective coatings to metal surfaces, physical properties, 11: 5302

development for static seals of the rotating plugs of the Submarine Intermediate Reactor, 11: 11789

development of high-temperature resistant, 11: 5853(R), 6701, 12024(R)

metal to metal, fatigue, strength, tensile properties, radiation effects on, 11: 4742

radiation effects, 11: 1108, 5808, 8857, 12692(R)

thermosetting and synthesis, 11: 208(R)

thickness, equipment for measuring, 11: 5302

Adrenal glands

radiation effects on rat, 11: 1731(J), 9197(J)

Adrenal hormones

influence on reticulo-endothelial uptake of colloidal thorium, 11: 5713(J)

Adrenocorticotropic hormone

effects on nucleic acid metabolism in normal and x-irradiated rats, 11: 10398

protective effects against radiation injuries in rats, 11: 7072(J)

Adsorbents

(See also Carbon; Charcoal; Clays; Filter Materials.)

efficiency, for separation of Pu from fission products, 11: 11619

efficiency of, in adsorption of fission products, 11: 13019(R)

testing and evaluation for waste processing, 11: 2489

Adsorption

(See also Absorption; Heat of adsorption; Sorption.)

direct measurement of monolayer, on Geiger tube windows, 11: 3883(J)

of hydrogen on metals, 11: 5908(J)

hydrolytic and ion pair, 11: 3766

inversion, labeled atom study, in ultra-micro-concentration range, 11: 204(J)

physical and chemical, review, 11: 4375(J)

theory, 11: 7151(J), 10040, 11131(J)

Adsorption separation processes

(See also Ion exchange processes.)

fission-product desorption, 11: 7521

plutonium separation from UNH solutions, progress reports, 11: 7517(R)

properties of adsorbents in, 11: 11620(R)

for U recovery, 11: 6683

Aerial surveying

(See also Radiation monitoring.)

performance of a scintillation counter for, 11: 5437

Aerodynamics

(See also Boundary layer; Fluid flow; Gas flow; Supersonic flow.)

boundary layer control, application of porous materials, 11: 7169

drag and lift effects on torque–rotation relation of a crossed-flexure pivot, 11: 10112

manual on aerodynamic stability, 11: 10587

Aerojet General Corp., Azusa, Calif.

progress reports of polyphenyl-coolant burnout studies, 11: 6704(R), 12012(R), 12891(R), 13308(R)

progress reports on experimental studies on heat transfer and fluid-flow systems, 11: 1032(R), 6703(R)

Aerojet General Corp., Azusa, Calif. (cont'd)

progress reports on reactions of molten metal with water, 11: 304(R), 3394(R), 3834(R), 3835(R), 4448(R), 5330(R), 8916(R), 10884(R), 10885(R), 10886(R), 13574(R)

Aeroprojects, Inc., West Chester, Penna.

progress reports on applications of ultrasonic energy, 11: 5889(R), 8943(R), 10111(R)

progress reports on feasibility of ultrasonic liquid-liquid extraction, 11: 185(R), 1822(R), 4363(R)

Aerosol generators

(See also Smoke generators.)

design and performance, 11: 52(R), 1771(J), 2944(J), 7223, 8793(R), 13228

design for producing large-area uniform radiation sources, 11: 10151(J)

Aerosols

(See also Colloids; Dust hazards; Particles; Powders; Smokes.)

bibliography, 11: 5378

collection, analysis, generation, measurements, review, 11: 5917(J)

containing Be, detection equipment, 11: 2806(J)

control and particle removal from air, 11: 6010, 7595, 13597(R)

deposition in respiratory tract, 11: 2255, 5735(J)

dispersal, meteorological factors, 11: 6209(R)

electrostatic deposition of, 11: 6322, 8038(J)

entrainment equipment, 11: 52(R)

filtration, 11: 2553(R), 3886(R), 10122

filtration activities at AEC sites, 11: 7595

formation, 11: 7223

formation, coagulation rates and potential barriers, 11: 4502(J)

formation, ionization effects on concentrations of ultramicroscopic particles and on nuclear condensation, 11: 1929(J)

formation in various atomic plants, survey, 11: 395(J)

particle size measurement, 11: 2243(R), 2255, 3445, 7223, 7942, 8037(R), 8947(J), 9223, 11018

penetration through lead-shot columns, effect of particle size, 11: 1030(J)

penetration through sand and fiberglas filters, effects of particle size, 11: 1029(J)

physical properties of Rn, 11: 8838

preparation of NaCl with attached Rn, 11: 8838

properties and behavior, 11: 2473

radioactive, air activity review, 11: 3689(J)

sampling devices, critical comparison of collection efficiencies, 11: 8039(J)

Agathla Peak Quadrangle (Ariz.-Utah)

geologic map, 11: 6728(J), 6729(J), 6730(J), 6732(J)

Age estimation

ionium method, 11: 7999(J)

methods and instruments in C^{14} dating, 11: 2992(J), 5442(J), 5977(J)

in Ozegahara peat, by C^{14} counting, 11: 771(J)

by potassium–Ar, Rb–Sr, and K–Ca methods and Ar^{40}–K^{40} dating, 11: 8001(J)

solid diffusion in radioactive minerals, 11: 4868(J)

use of monazites for, 11: 4867(J)

Agriculture

conference on radioisotopes in, 11: 4804

Air

(See also Atmosphere; Breath; Gases; Meteorology; Stack disposal; Ventilation.)

analysis for Hg, 11: 8827(J)

chemical reactions with Na, 11: 6521(R)

cleaning, equipment for, 11: 3886(R), 8837

cleaning and decontamination, seminar on, 11: 2473

cleaning techniques at AEC sites, 11: 7595

contamination, meteorological factors, 11: 1026, 6001

contamination by Ar^{41}, 11: 2721

contamination by NO_2, HNO_3, and UO_3, 11: 7046

contamination by Na^{24} and I^{131}, 11: 11427

contamination by stack effluent, 11: 7731(R), 12838

corrosive effects on U coatings, 11: 7655(R)

decontamination, efficiency of filters, 11: 4328, 11038, 11649, 11975

gamma scattering cross sections, 11: 11329, 13532

heat transfer correlations for, flowing across banks of finned tubes, 11: 6329

ion pair production in, by Co^{60} gamma radiation, energy measurements, 11: 2941(J)

irradiation products, 11: 2301

maximum allowable concentration for beta contamination, 11: 2238

monitoring for B, 11: 11080

monitoring for fall-out, 11: 1749(R), 7069, 8804(J), 12807, 12838

monitoring for Kr^{85}, 11: 8790(R)

monitoring for Pu, 11: 892, 5714, 10443, 10803(R), 12809

monitoring for radon content, 11: 3305(J), 3494(J), 6211, 11941(J)

neutron cross sections for, 11: 1618(R), 7286, 7310, 10365

pollution, aerosols, gas and vapor analysis, review, 11: 5917(J)

sample activity, effect of sample flow rate and particle size, 11: 3445

sampling, efficiency of filter materials, 11: 8792(R)

sampling, efficiency of filter media and air flow rate meters, 11: 8791(R)

sampling, performance of automatic equipment, 11: 6209(R)

sampling, performance of electrostatic precipitator, 11: 2243(R)

sampling, performance of equipment, 11: 8259(R)

sampling and modification of sampler, 11: 13571(R)

sampling equipment, performance, 11: 7920(R), 8793(R)

sampling in coal mines, 11: 13318(J)

sampling of stratospheric, performance of electrostatic precipitator, 11: 1263

sampling using annular impactor, 11: 6435

shock Hugoniot of, 11: 9348(J)

thermodynamic properties from 2000 to 15,000°K, 11: 443

Air cleaning conferences

reports of seminars held Sept. 1957, at Ames Lab., 11: 2473

Air cooled reactors

See BEPO; Brookhaven Reactor; Gas cooled reactors; ORNL Graphite Reactor.

Air Force Engineering Test Reactor

blast effects tests of one-quarter scale model, 11: 6889

design of reactor and plant facilities, 11: 671(J)

Air Force Engineering Test Reactor (cont'd)
reactivity, 11: 1669(J)

Aircraft
(See also Nuclear aircraft; Nuclear Test Aircraft; Ramjets.)
alloy fabrication for thermal flight up to 1200°F, 11: 8933(J)
atomic power for, bibliography, 11: 9123(J)
radiographic inspection of components without disassembly, 11: 10521(R)
sonic effects on, tests for determining, 11: 6341
structural materials for, properties, 11: 307, 1136(R), 2925, 3851(R), 5336, 5337
structures, thermal problems in, 11: 325, 326, 1505, 1515(R)

Aircraft engines
See Aircraft reactors; Nuclear Aircraft Power Plants; Rocket motors; Turboject engines.

Aircraft equipment
(Including wheels, tires, propellers, radar, hydraulic systems, etc.)
radiation effects, procedures for determining, 11: 2180, 2181, 2183

Aircraft Reactor Critical Experiment
critical assembly design, reactivity, and neutron flux distribution, 11: 13183

Aircraft Reactor Experiment
cleaning and decontamination, post-operative, 11: 13898
control rod fabrication, 11: 13182
fuel circuit delayed neutron activity, 11: 13132
operation as power producer, feasibility, 11: 9114(J)
power level determination by fuel activation, 11: 13135
temperature control servomechanism, 11: 13130

Aircraft reactors
(See also specific aircraft reactors and Nuclear aircraft.)
design considerations, 11: 3269(J)
fuel element temperature distribution, 11: 13186
shielding, air duct weight penalty, 11: 13213
thermal, with D_2O, water hydrocarbons, or water-alcohol as moderator, 11: 5121(P)
thermal nuclear, design of, 11: 1335(J)

Airfoils
drag coefficients of various shaped, 11: 8024

Alanine, β-mercapto-
See Cysteine.

Alaska
geologic investigations of radioactive deposits in, 11: 3825, 6357(R), 10084(R)

Albumins
radioinduced changes, 11: 839(J), 3286(J), 4278(J), 6603(J)

Alcohols
(See also Ethanol; Methanol.)
chromatographic separation and identification, 11: 6297(J)
constrictions and densities for deuterium labeled, isotopic effect, 11: 11099
effects on survival of irradiated mice, 11: 8800(J)
infrared spectra of n-butyl, 11: 10485
radiation chemistry, 11: 960(J)

Aldehydes
radiation chemistry, 11: 960(J)

Algae
(See also Plankton.)
carbon dioxide metabolism, effect of Mn deficiency, 11: 7091(R)
carbon dioxide metabolism, tracer study using C^{14}, 11: 1491, 4814(R)
concentration of fission products by, 11: 4400(J)
growth, effects of x radiation on, 11: 9199(J)
growth in D_2O-containing media, 11: 4814(R), 7091(R)
iodine metabolism, tracer study, 11: 4261
radiosensitivity of CO_2 fixation in, 11: 7091(R)

Alkali metal borohydrides
thermodynamic properties in liquid NH_3, 11: 3681

Alkali metal chlorides
thermodynamic properties with mixtures of $ThCl_4$, 11: 9994(J)

Alkali metal chlorides (liquid)
reduction of Ti chloride in, 11: 4459

Alkali metal halide crystals
coloration, 11: 12963(R)
dielectric strength of, dependence on duration of applied voltage, 11: 418(J)
lattice vibrations, 11: 6855(R)
optical properties, 11: 9579(R)
photo-capacitive effect in, 11: 13578(R)
properties, effects of radiation on, 11: 762, 4038(J), 7888(R), 8264, 8283(R)

Alkali metal halide systems
with $MgCl_2$, activity, calculations, 11: 339(J)
pycnometric and x-ray densities, 11: 2823(J)

Alkali metal halides
(See also specific systems, e.g., Alkali metal fluoborate–alkali metal halide systems.)
coloration and luminescence, 11: 5376(J)
compressibility, determination by shock wave measurement, 11: 13361
electrical conductivity, radiation effects on, 11: 12339(R)
electromotive forces of thermochains, 11: 5194(J)
energy level calculations for F-centers and interstitial positive ions in, 11: 12777
equation of state at high pressure, 11: 13361
flash photolysis of aqueous solutions, kinetics of the dihalide ions from, 11: 11075(J)
lattice defects, origin and properties of crystal, 11: 4912(J)
radiation effects, 11: 7358
radiation effects, theory of color centers, 11: 13549(J)
radiation effects and infrared spectra, 11: 12970(R)
spectrophotometric analysis for Fe^{3+}, 11: 11580
thermoluminescence of crystals, 11: 6756(J)
vacancy-pair dissociation at various temperatures, 11: 7693(R)

Alkali metal halides (liquid)
electrical conductance, density, and molar volume, 11: 8286(R)
electrical conductance and density, 11: 11576(R)

Alkali metal hydrides

moderating properties, 11: 1703(J)

Alkali metal thorium halides

phase diagrams of sodium and potassium systems, 11: 8852(J)

Alkali metals

(See also Cesium; Lithium; Potassium; Rubidium; Sodium.)

flame photometric analysis, effect of flame temperature on, 11: 11931(J)

ion exchange separation from alkaline earth metals, 11: 9587(R)

isotopic analysis with synthetic aluminosilicate ion source, 11: 1230(J)

separation by electrodialysis, 11: 11648

separation from Li by extraction with dipivaloylmethane, 11: 121(J)

weight determination in borates, halides, nitrides, and nitrates, 11: 7122(J)

Alkali metals (liquid)

heat transfer and thermophysical properties, 11: 5362(J)

heat transfer performance and physical properties, 11: 5362(J), 5837(R)

Alkaline earth metals

(See also Barium; Beryllium; Calcium; Magnesium; Strontium.)

ion exchange separation, 11: 7954(J), 9587(R)

Alkaline earth oxides

liquid sintering of dolomites and calcium, effects of diffusion, 11: 2897(J)

Alkanes

diffusion cross sections, isotope effect, 11: 8833(J)

storage safety, effect of flash point, 11: 2250

Alkanes, nitro-

formation during irradiation of Redox and Purex systems, 11: 8320

Alkenes

deuterization, 11: 134(J)

electrochemical fluorination in non-aqueous solvents, 11: 3724(J)

Alkyl bromides

diffusion-controlled reactions following neutron capture, 11: 6246(J)

recombination of Br^{82} in, 11: 9216(J)

Alkyl fluorides

heat of hydrogenation at 248°C, 11: 950(J)

Alkyl halides

electron impact studies, 11: 3740(J)

Alkyl iodides

radiolysis, effects of structure, product concentration, O_2, temperature, and phase, 11: 7962(J)

radiolysis by gamma rays, mechanism, 11: 7963(J)

Allanites

uranium and Th occurrence in, as accessory mineral in igneous rocks, 11: 9291(J)

Allantoin

urinary excretion in x-irradiated-adrenalectomized rats, 11: 10398

Allegheny Ludlum Steel Corp. [Research Dept., Watervliet, N. Y.]

progress reports, 11: 1139(R), 5326(R)

Allis Chalmers Mfg. Co., Milwaukee

progress reports, 11: 2443(R)

Alloy separation processes

extraction of Pu and fission products from U by molten metals, 11: 7544(R)

liquid Mg and fused F^- extractions of U, 11: 7545(R)

liquid-metal extraction, 11: 13680(R)

liquid metal extraction of irradiated U and U–Th alloys, 11: 7546(R)

Alloys

(See also specific alloys and systems which are indexed with components arranged in alphabetical order.)

atomic size in, x-ray-diffraction effects, 11: 4471(J)

chemical analysis methods, review, 11: 5787(J)

combustion analysis for C, 11: 3700

control of gas content in light melts, 11: 3430(J)

corrosion by $HF-H_2O$ atmosphere at 1070°F, 11: 13055(R)

corrosion by H_2SO_4 and HF, 11: 8457

corrosion of γ phase, hydride phase formed during, 11: 13189(R)

crystalline structure and physical properties, atomic deformation effects, 11: 11282(J)

Curie temperature displacement by hydrostatic pressure, 11: 12095(J)

densitometric analysis, 11: 12489

diffusion parameters in x-ray absorption spectra of Co, Cr, Fe, and Ni, 11: 344(J)

diffusion process, effects of structure, 11: 3860(J)

extrusion, K factors based on starting loads, 11: 13815

fabrication for aircraft thermal flight up to 1200°F, 11: 8933(J)

formation mechanisms, table of, 11: 10095(J)

high-temperature properties, survey, 11: 8474

nonferrous, analytical methods review, 11: 5788(J)

oxidation and diffusion, review, 11: 5358(J)

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

radiation effects, 11: 6565(J)

radiation effects on precipitation-hardening, 11: 12288(R)

radioactivation analysis, 11: 2261

strength limitation, factors and effects which determine, 11: 332

structural theory, lattice constants, 11: 414(J)

theoretical models for, 11: 3426

theory of order in AB_2, 11: 12057

thermodynamic properties, behavior in various environments at 600 to 1000°C, 11: 3414(R)

time-deformation during creep testing at temperatures to 1200°F, 11: 3849

unstressed, attack by liquid Hg, 11: 5313(J)

Alloys (liquid)

See Metals (liquid).

Alpha beams

collimating holes for 1 μ, 11: 4549(J)

Alpha decay

of deformed nuclei, 11: 13447(J)

electron effects on, theory, 11: 6176(J)

energy, semi-empirical formula, 11: 3536(J)

fine structure in even-even nuclei, 11: 6504(J)

Alpha decay (cont'd)

hindrance factor calculations, 11: 4619

intensity on rotation excitation levels of Am^{241}, Pu^{240}, and U^{233}, 11: 3604(J)

relation to nuclear deformation, 11: 5529(J)

review, 11: 1381(J)

theory of, for nonspherical nuclei, 11: 2055(J)

Alpha particles

(See also Cosmic alpha particles.)

absolute counting, 11: 1980

absorption in gases, ultraviolet spectrometer for studying light emission in gases from, 11: 1274(R)

alpha scattering at 38.5 Mev, 11: 6561

applications in radiotherapy, 11: 10420(J)

beams of high-energy, of 1 μ to 1.5 μ diameter for irradiation of single cells in tissue cultures, 11: 5146(J)

biological effectiveness, compared with β particles, 11: 3289(J)

biological effects on dry spores of B. subtilis, 11: 11867(J)

biological effects on mice, 11: 868(J), 869(J)

biological effects on yeast compared with effects of β particles, 11: 8257(R)

decomposition of plutonium oxalates by intrinsic, 11: 173

detection and measurement, 11: 8888, 10803(R)

detection and measurement, characteristics of Rosenblum spark counters for, 11: 9006(J)

detection and measurement, design and performance of equipment, 11: 516(J), 1244, 1579, 2243, 2978, 3956, 5456(J), 6478(J)

detection and measurement, design of portable scintillation monitor, 11: 10660(J)

detection and measurement, proportional counter for, 11: 1603(J)

detection and measurement, scintillation counter for, 11: 1243, 2984(J), 3954

detection in air, 11: 12809

effect on n-type Ge single crystals, 11: 9506(J)

elastic scattering, 11: 3595(J), 5659(J), 6146(J)

emission, recording of α-γ-angular correlations, 11: 8090(J)

emission in nuclear disintegrations induced by 1-Bev protons, 11: 6932(J)

emission in photonuclear reactions in Cu, Ni, and Al, 11: 6549(J)

energy analyzer, sweep type differential, 11: 2980

energy measurement methods, 11: 12330(R)

energy measurements, 11: 485, 4245(J)

excitation of characteristic K x rays from Au and Cu by, 11: 12932(J)

formation from bremsstrahlung reactions in O^{16}, 11: 686(J)

grain density distribution of cosmic, at top of atmosphere, 11: 403(J)

high-energy kinematics of, data on, 11: 6867

inelastic scattering in MTA target materials, 11: 9887(R)

inelastic scattering of 40.2-Mev, from Al, V, Cu, Nb, Ag, Ta, Th, 11: 6952(J)

interaction between, and α-particle model of nuclei, 11: 5511(J)

ionization of gases by, 11: 52, 6677(J)

ionization of water by 5 Mev, energy loss, 11: 12931

monitoring in waste streams, instrument for, 11: 5963

Alpha particles (cont'd)

neutron scattering by, contribution of tensor forces to, 11: 4733(J)

pathological effects, 11: 2245(R)

pathological effects on thyroid gland in rats, 11: 9918(J)

production by meson reaction with C^{12}, 11: 2150(J), 2151(J)

production in nitrogen nucleus interactions with emulsion nuclei, 11: 4720(J)

radioautographic determination in tissue sections following injection of thorotrast, 11: 2811(J)

radiolysis of NH_3 induced by, 11: 6669(J)

range-energy and range-momentum curves, 11: 12281

ranges in materials, sample preparation for measurement of, 11: 13576(R)

ranges in polychlorotrifluoroethylene, 11: 3028

scattering, optical model of elastic, 11: 6146(J), 10348(J)

scattering by α particles, 11: 751(J); 3198(J)

scattering by He, 11: 752(J)

scattering by heavy elements from 13 to 42 Mev, 11: 5659(J)

scattering by Li^6, C^{12}, and Mg^{24} at 31.5 Mev, 11: 746(J)

scattering theory, elastic, 11: 3595(J)

vaporization of metals by, 11: 5524(J)

Alpha sources

glove box system for use with, 11: 5236

self absorption of α particles in, 11: 4565

standards, calibration, production, and properties, 11: 6571

Alpha spectrometers

design of magnetic analyzer, 11: 9772(R), 12504(R)

magnetic precision, 11: 3484(J), 3975(J)

use of pulse ionization chambers as, design and performance, 11: 8091(J)

Alternating-gradient focusing

in linear accelerators, 11: 3105, 3106, 3119, 3123, 3125, 3133, 3141, 3185(J)

mathematical analysis, 11: 3111, 3120, 3122, 3124

theory of, in linear accelerators, 11: 9148(J)

Altimeters

electrical, development and application for aircraft, 11: 12116(J)

Alumina

(See Aluminum oxides.)

Aluminum

activation analysis for uranium content, 11: 13266

activation determination in NiO_2, 11: 8296(R)

alpha, p, and d reactions at high energies in, absolute cross sections for production of secondary particles, 11: 4114

alpha-particle scattering at 40.2 Mev, 11: 6952(J)

angular distribution of 424-Mev protons elastically scattered from, 11: 10350(J)

anodic oxidation, 11: 1887(J)

anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)

arc welding in argon atmosphere, 11: 3836

beta-particle absorption in, relation between energy and half thickness, 11: 750(J)

Aluminum (cont'd)

bonding to metals, 11: 7677(R)

bonding to metals and alloys by hot-pressing, 11: 13794(R)

brazing of spacing fins of, to flat-plate Al-clad fuel elements, 11: 11694

bremsstrahlung polarization vs. photon energy for 1-Mev electrons, 11: 1557

burnout in water, 11: 12443

chemical reactions, pressure transients in irradiated Al–H_2O systems, 11: 12444

chemical reactions with H_2O, effect of H formed and metal lost, 11: 2253

chemical reactions with UO_2, 11: 4451

cladding of U plates with Ni coating, 11: 13777

coated with Ni, Cu, or Cr, wetting properties, 11: 7660(R)

colorimetric determination in U, 11: 12352(R)

coprecipitation with $Fe(IO_3)_3$ from homogeneous solutions, 11: 2863(J)

corrosion, 11: 7708(R), 10891(R), 13197(R)

corrosion, alloying effects of Cu, Fe, and Ni on, 11: 12033(J)

corrosion, effects of radiation on, 11: 11566(R)

corrosion, heat transfer effects on, 11: 1517

corrosion, measurements, 11: 6350, 7991

corrosion by air at elevated temperatures, 11: 13883(R)

corrosion by fluorine gas at high temperatures, 11: 7184

corrosion by Hanford water and solutions, 11: 7613(R)

corrosion by high-temperature pressurized water, 11: 9290

corrosion by high-temperature NaOH, 11: 5312

corrosion by high-temperature water, 11: 2903(J), 8705(R), 10886(R), 11684, 12443, 12731

corrosion by high-temperature water, identification of products by analysis of infrared transmission spectra, 11: 10535

corrosion by reactor cooling water, effects of trace metals on, 11: 8456

corrosion by reactor slurries, 11: 7716

corrosion by solutions of potassium tetraborate, 11: 13054

corrosion by tetralin, 11: 7848(R)

corrosion by tropical environments, 11: 10538

corrosion by uranium nitrate solutions, 11: 1867

corrosion by water, 11: 11687(R), 11746(R), 12521, 13597(R), 13837(R), 13869(R)

corrosion by water, effects of deuteron, electron, and neutron irradiation on, 11: 8737

corrosion by water, inhibition by addition of sodium silicate, 11: 10536

corrosion by water at 100°C, mechanisms and effect of inhibitors on, 11: 5862(J)

corrosion by water in storage basin of fuel element jackets, 11: 270

corrosion films on, thickness, 11: 11685

corrosion inhibition with, for stainless steel in HF–HNO_3, 11: 7610

as corrosion inhibitor of stainless steel in U derby pickle baths, 11: 7603

corrosion inhibitors for 2-S, in H_2O, 11: 13868(R)

corrosion of Be affected by, 11: 7680

corrosion of 2S, in demineralized H_2O, 11: 7618

corrosion of 63S, by flowing tap water and stagnant demineralized water, 11: 10874

corrosion problems, 11: 347(J); 2902(J)

corrosion products on, bibliography, 11: 12031(J)

Aluminum (cont'd)

corrosion under Hanford reactor conditions, 11: 7605

creep, effects of radiation on, 11: 6364

creep characteristics in reactors, 11: 7691(R)

creep deformation, effects of solid solution alloying on, 11: 5899(J)

cross sections, 11: 13197(R)

density, microstructure, and tensile properties of rolled green strip, 11: 9749

degassing by sonic and ultrasonic waves, 11: 3857(J)

determination in homogeneous reactor solutions, 11: 4292(J)

deuteron inelastic scattering cross sections at 190 Mev, 11: 8735(R)

deuteron reactions (d,n), 11: 9778

diffusion in U, 11: 10497

diffusion into Ni-plated U flats, 11: 5879

diffusion of U into, effect of temperature, 11: 13922

dip coating of, with Pb, 11: 13794(R)

dissolution, organic emulsion formation during, 11: 7503(R)

dissolution by HNO_3–$Hg(NO_3)_2$, 11: 11567(R)

dissolution in liquid BrF_3, 11: 7407(R)

elastic modulus, effect of pulse annealing after cold work on, 11: 7693(R)

elastic properties and damping capacity, effect of temperature on, 11: 343(J)

electrodeposition from hydride bath, 11: 1899(J)

electrodeposition from organic solutions, 11: 1898(J)

electrodeposition of UO_2 on, 11: 1838(J)

electrodeposition on Th, 11: 13783

electrodeposition on U, 11: 7635

electron attenuation in, spatial distribution of energy absorbed from, 11: 6954(J)

electron energy loss and straggling at 150 Mev, 11: 4152(J)

electron energy losses in, and its compounds, 11: 745(J)

electroplating, 11: 7660(R)

electroplating with Cu, 11: 11203

erosion in deionized water, 11: 10534

explosive reactions with H_2O at high temperatures, 11: 2511

fabrication, effect of leakage on, 11: 1912(J)

fatigue properties, effects of complex stress-time cycles on, 11: 11240(J)

fission product permeability, 11: 1316

formation of films on, immersed in water, 11: 10082(J)

fracture tests, 11: 12049

gamma absorption cross sections, 11: 12287(J)

gamma heating, 11: 4675, 5614(J)

gamma reaction, energy and angular distribution of photoprotons from, 11: 8204(J)

gamma reactions (γ,α), 11: 6549(J)

gamma reactions (γ,π^-), 11: 4115

heat of vaporization and melting point, 11: 1471

impurity analysis by radioactivation and scintillation spectrometry, 11: 4284

industrial uses, ores and ore processing, occurrence, properties, production, 11: 5906(J)

Aluminum (cont'd)

inelastic scattering of slow neutrons by lattice vibrations in, 11: 10346(J)

intergranular corrosion, effect of water temperature, 11: 13922

internal defects automatic flow detector for, sonic inspection, 11: 13050

internal friction and Young's modulus, apparatus for precise determination at elevated temperature, 11: 12123(J)

internal friction restoration after removal of load, 11: 13350(J)

internal stress formation in, 11: 12065(J)

mechanical properties at very low temperatures, 11: 8006

mechanical properties of aircraft structural, data, 11: 1051

meson (π^+) production by 340-Mev protons by, 11: 5989(J)

metallography of high-purity, 11: 3428

multiple scattering of 0.4-Mev electrons and positrons by, 11: 5398(J)

neutron, proton, deuteron, He^3, and α scattering cross sections, 11: 10996(R)

neutron activation cross sections, 11: 1980, 12519

neutron cross sections, multigroup, 11: 12284

neutron elastic scattering cross sections, 11: 2174(J)

neutron production from cosmic-ray interactions in, 11: 687(J)

neutron reactions, effect on gas formation, 11: 3577

neutron reactions (n,p), angular on distributions and energy spectra, 11: 9141(J)

neutron reactions (n,p), energy distribution of protons from, 11: 5623(J)

neutron scattering at 2.5 and 7.0 Mev, 11: 3035(J)

neutron scattering at 4.4 Mev, 11: 2022(J), 3592

neutron scattering in, 11: 8153(J)

neutron total cross sections, 11: 10229

neutron transmission coefficients, 11: 6856

neutron transmission cross section from 1 to 140 kev, 11: 6863(R)

neutron yields from deuteron, neutron, and proton reactions, 11: 8726

nuclear interactions of cosmic rays in, 11: 9358(J)

nuclear relaxation in superconducting, 11: 12766(J)

nuclear size studied by cosmic-ray interactions, 11: 6058(J)

nucleon momentum in, from high-energy photoeffect, 11: 3021(J)

oxidation of powdered, kinetics, 11: 3806

pair production cross sections at 2.5 Bev, 11: 11378(J)

penetrability of thin layers of, for Li positive ions, 11: 8023(J)

photoemission and secondary electron discharge additivity of, 11: 1944(J)

plutonium determination in presence of, 11: 7438

positron annihilation in, lifetime of, 11: 437(J)

potentiometric titration in aqueous solutions, 11: 8285(R)

properties, evaluation as high-temperature high-pressure process tube and slug jacket material, 11: 11193

properties, metabolism, and effects on man, 11: 7082(J)

proton cross sections at 900 Mev, 11: 5555(J)

proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)

proton ranges in, from 6 to 18 Mev, 11: 6142(J)

protons scattered at 96 Mev by, energy spectrum, 11: 612(J)

radiation effects, 11: 1276(R), 1922(R), 8747(R), 9158(J)

radioactivity induced in, by reactor irradiation, 11: 13200

reactions produced by electrical explosion of, immersed in fluids, 11: 9753

Aluminum (cont'd)

recrystallization hardening, 11: 10103(J)

rolling and recrystallization texture, 11: 10102(J)

segregation substructure, 11: 6384

separation by fractionating from fission product solutions, 11: 4362

separation from Fe by precipitation of $Fe(IO_3)_3$, 11: 2864(J)

separation from Na^{22} by cation exchange, 11: 196(J)

separation from Pu by precipitating $La(OH)_3$ by NaOH, 11: 10825

separation of U from, by ion exchange in nitrate media, 11: 11982(J)

solder bonding of, to U, 11: 12471

soldering to stainless steel, 11: 12743

solid-solution hardening, 11: 9340(J)

solvent extraction, 11: 2356

solvent extraction from acid leach liquors, 11: 2357

solvent extraction from Florida leached zone material, 11: 11647(R)

solvent extraction from U ores, 11: 13290

spallation by cosmic radiation, 11: 12772(J)

spectrographic analysis for Pt, 11: 3336

spectrographic determination in pitchblendes and U–Mg slurries, 11: 12971(R)

spectrophotometric determination in reactor fuels, 11: 8296(R)

spectrophotometric determination in reactor solutions, 11: 12973(R)

spectrophotometric determination with 8-hydroxyquinaldine and oxine, 11: 120(J)

spectrum of inelastically scattered neutrons from, 11: 10910

structure, hardness, and tensile properties, 11: 10103(J)

tensile properties, 11: 12473(R)

thermal conductance of contacts between, and other metals, 11: 4893(J)

transit times of compression sound waves in, 11: 2492

tubes, flame cutting in graphic matrix, 11: 1512

use in atomic energy, 11: 347(J)

for use in ionization chamber construction, radiation effects, 11: 2456

vacancies in, formation energy and concentration, 11: 7889(R)

vacancy formation, energy of, 11: 11234(J)

vacuum fusion analysis for H_2, 11: 7629(R)

viscous creep near melting temperature, 11: 3422

volumetric determination, 11: 923, 2826

wastes, alkaline treatment of high level radiation, 11: 10509

welding, application of ultrasonic energy to cold, 11: 11207

Aluminum (clad)

corrosion and radiation effects, 11: 13869(R)

corrosion by H_2O at 600°F, 11: 11745(R)

creep and rupture stresses at high temperatures for jet applications, 11: 307

Aluminum (liquid)

chemical reaction tests, 11: 12968

high-temperature reactions with water, 11: 3834(R), 4448(R), 8916(R), 13754(R)

oxide film, electronographic studies at 660 to 1100°C, 11: 1897(J)

Aluminum alloy–stainless steel couples

corrosion by simulated reactor cooling water, 11: 3399

bibliographies, 11: 7082(J)

bonding to Mg by pressure welding and cold rolling, 11: 9737(R)

Aluminum alloy–uranium couples

diffusion in, 11: 7749

Aluminum alloys

activation analysis for Cu, Fe, Ni, Mn, Zn, and Ti, 11: 1776

arc welding, effect of halogens and halides in inert gas metal, 11: 5881

corrosion, 11: 13197(R)

corrosion, mechanism of high-temperature, 11: 6717

corrosion by biphenyl, 11: 5310

corrosion by bromine fluorides, 11: 13883(R)

corrosion by distilled water at 350°C, 11: 7629(R)

corrosion by high purity water, 11: 12034(J)

corrosion by high-temperature pressurized water, 11: 9290

corrosion by high-temperature water, 11: 10988(R)

corrosion by high-temperature water, identification of products by analysis of infrared transmission spectra, 11: 10535

corrosion by simulated reactor cooling water, 11: 3399

corrosion by synthetic plant solutions, 11: 13027(R)

corrosion by water, 11: 6909(R), 11183, 12608(R)

corrosion by water at 100°C, mechanisms and effect of inhibitors on, 11: 5862(J)

corrosion by water at 290°C, 11: 13870(R)

corrosion by water at 480°F, 11: 14020(R)

corrosion of, for cladding purposes, 11: 13189(R)

corrosion problems, 11: 347(J), 2902(J), 4664(R)

creep, application of absolute rate theory to, 11: 2916

creep-rupture, tensile properties and thermal cycling, tests of, 11: 1136(R)

creep testing, 11: 8519(R)

cryogenic data, 11: 386

diffusibility, effect of fission products on, 11: 11712

fatigue tests, 11: 5884

fracture, 11: 6742

gamma absorption, 11: 10521(R)

internal stress formation in, 11: 12065(J)

mechanical properties at high temperatures, 11: 323, 1506, 4881

mechanical properties of aircraft structural, data, 11: 1051

neutron reactions (n,γ), 11: 13209

porosity of cast, 11: 11690(R)

powder fabrication, mechanical properties, and extrusion, 11: 8924

properties of, for reactor process tubes, 11: 8170

radiographic inspection, 11: 10521(R)

soldering to stainless steel, 11: 12743

temperature and stress, thermal radiation effects, 11: 326

testing, methods and evaluation, 11: 12020

thermal capacity, 11: 4817

use in atomic energy, 11: 347(J)

Aluminum alloys (Al clad)

heat and load correlation with temperature and load properties, 11: 1136(R)

tensile properties, effects of strain rate and temperature holding time on, 11: 2925

Aluminum alloys (clad)

time-deformation during creep testing at temperatures to 1200°F, 11: 3849

Aluminum alloys (liquid)

oxide film, electronographic studies at 660 to 1100°C, 11: 1897(J)

Aluminum–aluminum oxide systems

tensile properties, dispersed particle strengthening, 11: 5360(J)

Aluminum–antimony alloys

electron diffraction study of the formation of thin layers, 11: 10436(J)

Aluminum–beryllium alloys

casting, 11: 8491(R)

casting, effect on grain size, 11: 13788(R)

neutron yields from deuteron bombardment of targets, 11: 9886(R)

Aluminum–beryllium compacts

preparation and tensile properties, 11: 2526

Aluminum–boron carbide systems

effectiveness as reactor control rod material, 11: 11745(R)

Aluminum–boron systems

corrosion of, and cladding for reactor fuel plates, 11: 1276(R)

preparation, physical properties, radiation effects, and corrosion, 11: 4464(R)

Aluminum–boron–uranium systems

preparation, physical properties, radiation effects, and corrosion, 11: 4464(R)

reactor fuel elements of, properties of, 11: 7807

Aluminum–cadmium–copper alloys

corrosion and stress corrosion, 11: 277

Aluminum–cerium alloys

preparation and properties, 11: 8492(R)

preparation for U cladding, 11: 8491(R)

Aluminum chlorides

chemical reactions with graphite, 11: 5200(J)

chemical reactions with UF_4, U_3O_8, UO_3, UO_2, and UO_2F_2, 11: 5285

reaction of, with boron fluoride complexes, 11: 9984

vaporization, 11: 9585

Aluminum–chromium–iron–molybdenum–titanium alloys

heat treatment, 11: 4456(R)

Aluminum–chromium–iron–titanium alloys

heat resistance, properties at elevated temperature, 11: 372(J)

Aluminum–chromium–molybdenum alloys

fatigue effects in contact friction, 11: 8014(J)

Aluminum–chromium–nickel–titanium alloys

phase diagrams of gamma and eta phases, 11: 1166(J)

Aluminum–chromium–silicon coatings

testing of oxidation-resistant, for Mo, 11: 12749

Aluminum–chromium–titanium alloys

heat treatment, microstructure, and phase studies, 11: 357(J)

phase transition from β into ω and α, kinetics, 11: 12060(J)

photomicrographs, 11: 6739

tensile strength at 650°C, 11: 7626(R)

Aluminum coatings

(See also Aluminum alloys (Al clad); Aluminum–uranium alloys (Al clad); Uranium (Al clad).)

corrosion by fuel–oil ash constituents, 11: 1077

corrosion rate in reactor coolant water, 11: 8451(R)

heat and corrosion-resistant, testing for steel, 11: 3385(R)

nondestructive measurement of the thickness of, on U, 11: 8465

Aluminum coatings (cont'd)
preparation, 11: 13093(R)
thickness, instrument for measuring, 11: 13049
on uranium, corrosion in boiling water, 11: 7635
for uranium, preparation, 11: 7657(R)
Aluminum–cobalt alloys
diffusion of Co in, 11: 6397(J)
high-temperature properties for aircraft gas turbines, 11: 5326(R)
temperature effects on hardness and crystal structure, 11: 1155(J)
Aluminum–cobalt–manganese alloys
analysis for Co, 11: 8296(R)
Aluminum compacts
properties, evaluation as high-temperature high-pressure process tube and slug jacket material, 11: 11193
Aluminum compounds
constitution of aluminum halide ammoniates, 11: 11921(J)
Aluminum–copper alloys
(See also Aluminum bronze.)
corrosion and stress corrosion, 11: 277
corrosion resistance in high temperature water, 11: 12033(J)
electron-microscopic study of the precipitation of β-phase in, 11: 364(J)
tensile properties, effect of heat treatment on 2024-T3, 11: 6376
Aluminum couples
electrochemical corrosion, 11: 13747
Aluminum crystals
neutron scattering by phonons, 11: 1278(R)
plastic flow, effects of stress concentration and triaxiality on, 11: 11216
single, temperature dependence of recovery in cold-rolled, 11: 1160(J)
sub-structure formation in slightly bent, 11: 415(J)
Aluminum fluorides
crystal structure, 11: 7955(J)
Aluminum foils
dislocations in boundaries of substructure, arrangement and movement, 11: 370(J)
electron scattering by, at 20 kev, 11: 440(J)
for window unit for α particle scintillation detector, 11: 3642(P)
Aluminum–hafnium alloys
corrosion in biphenyl–water systems and biphenyl, isopropyl- –water systems, 11: 5309
Aluminum hydroxides
absorptive properties for fission products, 11: 5277
Aluminum–iron alloys
casting and air melting, 11: 13344
corrosion resistance in high temperature water, 11: 12033(J)
mechanical and physical properties, 11: 13343
welding, fusion and resistance, 11: 13345
Aluminum–iron compacts
extrusion, 11: 12500
Aluminum–iron–molybdenum alloys
fabrication and physical and mechanical properties, 11: 11206
properties for high-temperature use, 11: 1907(J)
Aluminum–iron–titanium alloys
mechanical properties, 11: 13343
Aluminum isotopes
energy levels studied by Mg(α,p) reactions, 11: 6057(J)
Aluminum isotopes Al^{25}
gamma emission, 11: 9054(R)
positron disintegration, 11: 708(J)
spins and parities of lower excited states, 11: 709(J)
Aluminum isotopes Al^{26}
decay schemes, 11: 1542(R), 5179(R)
Aluminum isotopes Al^{27}
alpha particle reactions (α,p), angular distribution of protons from, 11: 6113(J)
alpha reactions (α,3p), threshold and cross section for, 11: 11308(J)
deuteron reactions (d,αp), 11: 13837(R)
deuteron reactions (d,n), neutron spectrum from, 11: 1647(J)
deuteron reactions (d,p), 11: 12863(J)
deuteron reactions (d,p), and energy levels in Al^{28}, 11: 2096(J)
deuteron reactions (d,p), angular distribution, 11: 1542(R), 9186(R)
gamma reactions (γ,p), energy and angular distributions of protons from, 11: 6125(J)
neutron reactions (n,α) at 14.8 Mev, angular distribution of α particles from, 11: 6120(J)
neutron reactions (n,γ), (n,p), 11: 11739(R)
neutron reactions (n,p) and (n,α), cross sections, 11: 9140(J)
neutron reactions (n,p) at 14 Mev, 11: 5626(J), 9494(J)
neutron scattering cross sections, calculations of inelastic, 11: 6856
neutron transmission, 11: 8562(R)
nuclear quadrupole coupling in ionic crystals, 11: 3596(R)
proton reaction (p,γ) at 991 kev, direct determination of resonance width, 11: 602(J)
proton reactions (p,γ), resonances in, 11: 4614(R), 10756(J)
proton reactions (p,p'γ), 11: 1278(R), 9054(R)
Aluminum isotopes Al^{28}
beta emission, 11: 10996(R)
energy levels, existence of rotational, 11: 4041(J)
lifetime of first excited state, 11: 3050(J)
spin and parity of energy levels in, from Al^{27}(d,p)Al^{28} reaction, 11: 2096(J)
Aluminum–lithium alloys
chemical reactions with water effect of H formed and metal lost,
reactor criticality effects, 11: 10727
Aluminum–lithium–silicon systems
phase analysis of structure, 11: 1146(J)
Aluminum–magnesium alloys
bonding by pressure welding and cold rolling, 11: 9737(R)
creep behavior, effect of alloying elements on, 11: 5349
degassing by sonic and ultrasonic waves, 11: 3857(J)
hardness measurements at temperatures up to 500°C, 11: 8918
oxidation of powdered, kinetics, 11: 3806
properties, evaluation as high-temperature high-pressure process tube and slug jacket material, 11: 11193
recovery of cold-worked high-purity, 11: 1161(J)
vapor pressure of magnesium over, 11: 12754(J)

Aluminum–magnesium–titanium alloys

mechanical properties and phase studies, 11: 4456(R)

Aluminum–magnesium–uranium alloys

microstructure, 11: 8487(R)

Aluminum–manganese–titanium alloys

mechanical properties, effect of H on, 11: 5897

mechanical properties and stability, effects of thermal exposure, 11: 322

physical and mechanical properties, 11: 11195

tensile properties, effect of O, N, and C contaminants, 11: 1138(R)

tensile strength at 650°C, 11: 7626(R)

welding and physical properties, 11: 4458

Aluminum–molybdenum–titanium alloys

corrosion, strength, and thermal conductivity for fuel element jacketing,

mechanical properties at elevated temperatures, 11: 4479(J)

tensile properties, effect of O, N, and C contaminants, 11: 1138(R)

welding, effect of additions of C, and N_2 on, 11: 6391(R)

Aluminum–nickel alloy–chromium–nickel alloy couples

corrosion, 11: 13985(R)

Aluminum–nickel alloys

composition and preparation effects on structure of, and activity of bare catalyst prepared from, 11: 918(J)

corrosion, 11: 4664(R)

corrosion and radiation effects, 11: 13869(R)

corrosion by distilled water at elevated temperatures, 11: 7629(R), 7630(R)

corrosion by high-temperature water, 11: 11689(R), 11748(R), 12033(J), 12731, 13870(R)

corrosion by high temperature water, effects of Fe and Si on, 11: 8462(R)

corrosion by water, 11: 11746(R), 11747(R)

corrosion by water, effects of Fe and S ion, 11: 10887(R)

corrosion of M-388 in boiling water, 11: 13870(R)

corrosion resistance in high temperature water, 11: 12033(J)

diffusion bonding, 11: 6389(R)

impact behavior of, 11: 10557

mechanical properties, effects of heat treatment and composition on, 11: 5883

mechanical properties of M-388, at room and elevated temperatures and microstructure, 11: 6369

melting properties and Ni_3Al phase studies, 11: 3859(J)

microstructure, effect of alloying metals on, 11: 5883

phase studies, 11: 3859(J), 5883

recrystallization and rest at elevated annealing temperatures, x-ray analysis, 11: 1067(J)

solid solutions, structural properties, 11: 1152(J)

temperature effects on hardness and crystal structure, 11: 1155(J)

Aluminum–nickel–titanium alloys

physical properties, 11: 3412(R)

Aluminum–niobium–zirconium alloys

tensile properties and neutron absorption cross sections, 11: 7019(P)

Aluminum nitrate–hydrofluoric acid–nitric acid–thorium nitrate systems

corrosive effects of, on stainless steel, 11: 9587(R)

Aluminum nitrates

analysis for HNO_3, 11: 8292

Aluminum nitrates (cont'd)

chemical analysis of Diban, $Al(OH)_2NO_3$, 11: 9588

corrosive effects on Ni and Ni alloys, 11: 8379

electrodialysis, 11: 11648

precipitation from Redox waste using HNO_3, 11: 13004

precipitation in stainless steel containers at high temperatures,

preparation of acid-deficient, by electrodialysis, 11: 7413, 7497

specific gravity and refractory index of solutions, 11: 8279

Aluminum nitrides

crystal structure, 11: 1452

vaporization from 1660 to 2196°K, 11: 1857

Aluminum oxide–aluminum systems

See Aluminum–aluminum oxide systems.

Aluminum oxide–calcium oxide–silicon oxide systems (liquid)

electrolysis, 11: 7986(J)

Aluminum oxide–chromium compacts

preparation by low-frequency vibratory method, 11: 11181

Aluminum oxide–chromium systems

fission product permeability, 11: 1316

Aluminum oxide coatings

to graphite for protection of U casting molds and crucibles, 11: 11573(R)

wear resistance as bearing materials in ThO_2 slurry pumps, 11: 8900

Aluminum oxide–cobalt systems

oxidation studies by weight change, differential thermal, and x-ray-diffraction analysis, 11: 263(J)

Aluminum oxide compacts

modulus of rupture, 11: 12726

preparation by low-frequency vibratory method, 11: 11181

Aluminum oxide–copper systems

high-temperature strengthening by dispersion of hard particles, 11: 5360(J)

Aluminum oxide films

electron scattering by, at 20 kev, 11: 440(J)

formation on Al by anodic oxidation, 11: 1887(J)

formation on Al immersed in water, 11: 10082(J)

structure and crystallization, 11: 1783(J)

Aluminum oxide–iron oxide systems

electromotive force in, measurements of, 11: 6714(J)

Aluminum oxide–magnesium oxide systems

electromotive force in, measurements of, 11: 6714(J)

Aluminum oxide–manganese oxide–silicon oxide systems

viscosity of slags at 1400 to 1590°, 11: 7988(J)

Aluminum oxide–nickel systems

high-temperature strengthening by dispersion of hard particles, 11: 5360(J)

Aluminum oxide powders

compacting, with pneumatic forming machine, 11: 13331

Aluminum oxides

(See also Aluminum–aluminum oxide systems.)

alpha, sintering and grain growth, effects of additives and ball-milling on, 11: 266(J)

bearing material in high temperature water and Na, evaluation, 11: 2477

Aluminum oxides (cont'd)
catalytic properties, γ radiation effects on, 11: 4337(J)
corrosion by $CuSO_4-H_2SO_4-UO_2SO_4$, 11: 12465(R)
corrosion by fluorine gas at high temperatures, 11: 7184
corrosion by molten U and U alloys, 11: 13582(R)
corrosion by sodium borate melts, 11: 7188(J)
corrosion by U and U alloys, 11: 7408(R)
corrosion by uranyl sulfate solutions, 11: 8911, 12898(R)
corrosion in high-temperature water, identification of products by analysis of infrared transmission spectra, 11: 10535
corrosion resistance, strength, nuclear properties, and characteristics of, 11: 2477
diffusion of FeO in, at 1500°C, 11: 6714(J)
electrical stability of thin layers, 11: 6395(J)
electron and x-ray diffraction studies, 11: 1887(J)
flotation, effect of slime, 11: 4861(R)
interfacial reactions with Ce and La, 11: 2851
macrostructure and catalytic changes effected by 20,000 atm compression and vapor treatment, 11: 1894(J)
meson capture by different elements in, 11: 5984(J)
microstructure, heat treatment effects on, 11: 7987(J)
physical properties of sintered, effect of porosity and temperature on, 11: 1068(J)
radiation damage observed by ultrasonic attenuation and velocity measurements, 11: 762
recovery by flotation with paraffin chain salts, 11: 3784
refractory boats for U and U alloy zone melting, 11: 13807
with sodium, decomposition of the solutions, 11: 4816(J)
thermal conductivity, effect of microstructure on, 11: 12728(J)
thermal conductivity measurements in air, 11: 8542
thermal diffusivity and infrared transmission of sapphire, alumina, and mullite, 11: 11180
thermoluminescence, 11: 7218(J)
Aluminum–oxygen–titanium systems
preparation, heat treatment, phase studies, 11: 4475(J)
Aluminum phosphates
separation from kaolinites by selective solution in HCl, 11: 291(J)
Aluminum–plutonium alloys
crystal structure of $PuAl_3$ determined by single-crystal methods, 11: 11134(J)
fabrication, 11: 11689(R)
fabrication of fuel elements, 11: 7652
hardness and thermal expansion, 11: 11744(R)
plutonium recovery from irradiated, by TBP-processing, 11: 7141
Aluminum powders
blistering of, extrusion, 11: 8924
rolling, 11: 9749
Aluminum–silicon coatings
(See also Slug coatings (Al–Si).)
heat and corrosion-resistant, testing for steel, 11: 3385(R)
Aluminum–silicon systems
brazing assemblies for, 11: 12485
corrosion, 11: 7708(R)
corrosion by high-temperature NaOH, 11: 5312
corrosion by simulated reactor cooling water, 11: 3399
Aluminum–silicon systems (liquid)
corrosion of coated and uncoated U by eutectic, 11: 7673(R)
Aluminum–silicon–titanium systems
corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765
Aluminum–silicon–uranium systems
phase studies and diffusion rates, 11: 9324
radiation effects, 11: 11106
Aluminum–silver alloys
radiation effects, 11: 1922(R)
Aluminum–stainless steel couples
electrochemical corrosion, 11: 13747
Aluminum–thorium alloys
analysis, 11: 7663(R)
Aluminum–tin–titanium alloys
corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765
fatigue, effect of microstructure and interstitial elements on, 11: 5347
metallurgy, compilation of available information on Ti–5% Al–2.5% Sn, 11: 12053
physical and mechanical properties, 11: 11195
tensile properties, effect of O, N, and C contaminants, 11: 1138(R)
welding and physical properties, 11: 4458
Aluminum–tin–zirconium alloys
corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765
Aluminum–titanium alloys
compounds in the Ti-rich region of, constitution, effects of C, N, and O on, 11: 5901(J)
constitution diagrams, 11: 1893(J)
corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765
corrosion by water at 93 and 360°C and thermal conductivity, 11: 11688(R)
high-temperature properties, 11: 1165(J)
mechanical and physical properties in heat treatment and hot rolling, 11: 3431(J)
mechanical properties, effects of hydrogen on, 11: 11215
mechanical properties, preferred orientation, recrystallization, and rolling, 11: 1140(R)
microstructure, mechanical properties, effects of H_2 on, 11: 6393
phase studies, 11: 4468
tensile properties, effect of O, N, and C contaminants, 11: 1138(R)
welding, effect of additions of C, and N_2 on, 11: 6391(R)
Aluminum–titanium–tungsten alloys
mechanical properties at temperatures up to 600°, 11: 8015(J)
Aluminum–titanium–vanadium alloys
development, fabrication, mechanical properties, and welding, 11: 4457(R)
fatigue, effect of microstructure and interstitial elements on, 11: 5347
mechanical and thermal properties and metallurgy, effect of heat treatment on, 11: 6378
mechanical properties and microstructure, effect of forging on, 11: 5350
mechanical properties and microstructure of metal-arc welded, 11: 1528

Aluminum–titanium–vanadium alloys (cont'd)

mechanical properties and stability, effects of thermal exposure, 11: 322

phase studies, forging, melting, mechanical properties, and aging tests, effect of alloying elements on, 11: 6394

photomicrographs, 11: 6739

physical and mechanical properties, 11: 11195

uniformity of commercial ingots, 11: 13347

welding, effect of additions of C and N_2 on, 11: 6391(R)

Aluminum–uranium alloys

casting and fabrication, 11: 13766

chemical reactions with H_2O, effect of H formed and metal lost, 11: 2253

chlorination, dissolution by, 11: 7410

compound particle formation in low-U, 11: 8473

corrosion in boiling water, 11: 7665(R)

corrosion in storage basin water, 11: 8458

crystal structure, 11: 8548(R)

densitometric analysis and constitution diagrams, 11: 12489

dissolution by fused salt, 11: 8387(R)

dissolution by NaOH, 11: 2819(J)

dissolution by NaOH and HNO_3, 11: 13517(J)

dissolution by NaOH–$NaNO_3$, 11: 11613

dissolution by nitric acid, 11: 2819(J), 7572, 7648

dissolution by nitric acid solutions containing Hg^{+2}, 11: 8352(R)

dissolution to a dibasic $Al(NO_3)_3$ dissolver product, 11: 10470

explosive reactions with H_2O at high temperatures, 11: 2511

extrusion and fabrication, 11: 8476

fabrication of Al-clad, 11: 8472

fabrication of 2% Al, 11: 7647

gamma-transmission analysis for uranium, 11: 13605

growth on surface of Al coated U, 11: 10497

hot-hardness and grain structure, 11: 12317(R)

melting, casting, and extrusion, 11: 8530

metallurgical properties, 11: 11196

microstructure, 11: 8487(R)

phase studies, 11: 8495(R)

phase studies and metallurgical properties, 11: 13781

physical properties, 11: 8926

preparation and properties, 11: 8491(R)

preparation by "Chip Method" for foils, 11: 6310

properties of interest for use as refractory fuels, 11: 812

radiation effects, 11: 13627

rolling, 11: 7662(R)

rolling and cladding, 11: 13597(R)

rolling of clad, into sheets, 11: 8473

segregation at eutectic temperature, 11: 11237(J)

tensile properties, 11: 12473(R)

Aluminum–uranium alloys (Al clad)

colorimetric and densitometric analysis, 11: 8523

extrusion, 11: 7681(R)

fabrication, 11: 12494

Aluminum–uranium alloys (liquid)

static corrosion of metals by, 11: 9747

Aluminum–uranium carbide compacts

irradiation behavior as Materials Testing Reactor type fuel elements, 11: 3071

Aluminum–uranium compacts

preparation, 11: 6310

Aluminum–uranium couples

bond testing with and without metal interfaces and diffusion in, 11: 8466

heat transfer, 11: 5832(J)

radiation damage, diffusion, and microstructure, 11: 7749

Aluminum–uranium oxide compacts

analysis and properties, 11: 13901

irradiation behavior as Materials Testing Reactor type fuel elements, 11: 3070

preparation, sintered density, and fabrication of solid fuel plates of, 11: 13897

Aluminum–vanadium alloys

crystal structure, 11: 11703(R)

density and hardness studies, 11: 11701(R)

phase studies, 11: 4454(R), 7673(R), 8508(R), 8512(R), 11704(R)

preparation, 11: 8507(R)

spectrophotometric analysis for V, 11: 2828

structure of V_4Al_{23}, 11: 5929(J)

Aluminum–water systems

neutron reflecting properties in reactors, 11: 10294

neutron slowing down age at In resonance, 11: 13427(J)

Aluminum–zinc alloys

creep, stress, tensile and thermal properties, phenomenological relation at elevated temperatures, 11: 6738

tensile properties, effect of heat treatment on 7075-T6, 11: 6376

Aluminum–zirconium alloys

corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765

corrosion by degassed water at 360°C and thermal conductivity, 11: 11688(R)

creep and rupture behavior, 11: 1524

stress rupture in Na at 1000°F, 11: 1129

tensile strength at 650°C, 11: 7626(R)

American Cyanamid Co. Stamford Research Labs., Stamford, Conn.

progress reports on B production, 11: 7403(R)

American Meat Inst. Foundation, Chicago

progress reports on radiosterilization of meat, 11: 828(R)

Americium

activation determination, 11: 8296(R)

atomic spectra, measurement of, 11: 7154(J)

determination of, in presence of Pu, 11: 9595

electrodeposition of thin films, 11: 8836(J)

ion-exchange separation from Cf and Cm by elution with α-hydroxy isobutyric acid, 11: 1004(J)

neutron-activation determination in Amex solutions, 11: 11586(R)

oxidation, 11: 11563(R)

separation and purification of milligram quantities from Fe, U, and Pu, 11: 4358

separation from La by ion exchange, 11: 8398, 9259(J)

separation from rare earths by ion exchange, 11: 4844(J)

solubility in liquid NH_3, 11: 1474

Americium (cont'd
solvent extraction, 11: 13633(R)
solvent partition on Dowex in H_2SO_4, 11: 8288(R)
sorption on Dowex-50 resin, 11: 4376(J)
spark spectrum from 2500 to 8000 A, 11: 5679(J)
spectra, 11: 9579(R)
Americium chlorides
preparation, 11: 9074(J)
Americium compounds
preparation of $AmCl_3$, $Am_2(SO_4)_3$, and AmO_2, 11: 9074(J)
Americium ions
heats of formation of AmO_2^+ and AmO_2^{2+} in 1M $HClO_4$, 11: 5823(J)
Americium(V) ions
self-reduction and disproportionation in aqueous solution, 11: 11135(J)
Americium(VI) ions
self-reduction in aqueous solution, 11: 11135(J)
Americium isotopes
beta spectra, 11: 12341(R)
nuclear properties, 11: 13443
thermal neutron cross sections, review, 11: 10245
toxicology of Am^{241} and Am^{242}, 11: 893
Americium isotopes Am^{238}
energy levels, 11: 8568(R)
Americium isotopes Am^{239}
beta decay, energy levels of Pu^{239} studied by, 11: 6049(J)
electron-capture decay, 11: 6157(J)
Americium isotopes Am^{240}
electron-capture decay, 11: 6157(J)
Americium isotopes Am^{241}
alpha decay, x- and γ-ray intensities, 11: 10762(J)
alpha-gamma coincidence counting, 11: 7406(R)
alpha spectra, 11: 3371(J), 3604(J), 9074(J)
decay, attenuation of α-γ angular correlation in liquid film sources, 11: 4053(J)
fission and spallation competition, 11: 3578
fission yield curves, 11: 5539(J)
preparation of, as gamma source, 11: 769
radiations from, film response to, 11: 4937
spontaneous fission energy release, calculated, 11: 13444
Americium isotopes Am^{242}
isomeric transition, 11: 7690(R)
Americium isotopes Am^{243}
neutron capture cross sections, 11: 4976(J)
Americium oxides
preparation, 11: 9074(J)
Ames Lab., Ames, Iowa
metallurgy information meeting, May, 1956, 11: 4464(R)
progress reports, 11: 4810(R), 7692(R), 12322(R), 13669(R)
progress reports on chemical engineering, 11: 7428(R)
progress reports on chemistry, 11: 10428(R)
progress reports on chemistry of Pu, 11: 7418(R)
progress reports on engineering, 11: 1810(R), 2420(R), 8510(R), 11055(R)
Ames Lab., Ames, Iowa (cont'd)
progress reports on Hanford program, 11: 1877(R)
progress reports on Hanford slug program, 11: 9325(R), 13794(R)
progress reports on metallurgy, 11: 4454(R), 7676(R), 7677(R), 8507(R), 8508(R), 8512(R), 11700(R), 11701(R), 11702(R), 11703(R), 11704(R), 13083(R)
progress reports on physics, 11: 4632(R), 8117(R)
progress reports on properties of Th and Th alloys, 11: 7672(R), 8506(R), 8509(R)
Amex Process
americium isolation and purification from Hanford waste, 11: 8398
cost estimates and flowsheets, 11: 8356
determination of Am in process solutions, 11: 8296(R)
development, 11: 10475(R)
Amine Extraction Process
(Extraction of uranium from sulfuric acid leach liquors with amines.)
batch and continuous tests, 11: 975, 980(R), 3362(R)
development for U recovery, 11: 979(R), 3359(R), 3758(R), 3759, 4361(R), 5262(R), 7090(R)
flowsheets and equipment, 11: 214, 2858, 12706
pilot plant design, 11: 2336
progress report, 11: 12994(R)
solvent extraction studies with U and Mo, 11: 8869(R)
Amines
(For derivatives see by name of substituent, e.g., Dodecylamine acetate.)
preparation and solvent properties, 11: 2356
prophylactic effects against ionizing radiation of alkylmercapto-, 11: 11886(J)
reactions with boron hydrides, 11: 3368(R)
reactions with sodium borohydrides, 11: 3326
solvent properties for Ce, Y, Zr, Nb, and Ru, 11: 7969
solvent properties for Th, rare earths, Hf–Zr, and Co–Ni, 11: 10036(R)
solvent properties for U, 11: 214, 975, 982(R), 2312, 2856(R), 5256(R), 7142(R), 8869(R), 11647(R), 12706(R)
Amino acids
chemical determination in human serum lipoproteins, 11: 911
ion exchange chromatography of C^{14}-labeled, 11: 71(J)
radiation chemistry, 11: 960(J), 1736(J), 5247(J), 6283(J)
synthesis of C^{14}-labeled norvaline, norleucine, and leucine, 11: 9591(R)
Amino compounds
chromatographic separation and determination of glucosamine and galactosamine, 11: 2833(J)
pharmacology of β-aminoethylisothiuronium, 11: 5746(J)
protective effects of AET against radiation injuries in monkeys, 11: 7076(J)
synthesis and metabolism, 11: 4781(R)
Ammonia
adsorption on graphite, 11: 7959(J)
chemical reactions with boron hydrides, 11: 4381
exchange of N between ammonium ions in solution and, 11: 9664(R)
isotopic exchange of nitrogen with NH_3-saturated $(NH_4)_2CO_3$ solution, 11: 1227
oxidation by hypobromite, 11: 2233(R)
oxidation mechanism, 11: 2337(R), 12961(R)

Ammonia (cont'd)

radiolysis, effects of variations in intensity and pressure, 11: 6669(J)

radiosynthesis, 11: 4614(R), 9669

recovery from leach solutions, 11: 996

Ammonia (liquid)

corrosive effects on stainless steel, 11: 12733

heats of solution of Li, Na, K, and Rb borohydrides, 11: 3681

solvent properties for Eu, Yb, Sm, 11: 1474

Ammonium beryllium fluorides

vacuum decomposition pilot plant, 11: 2518(R)

vacuum decomposition to BeF_2, 11: 2519(R)

Ammonium bromides

crystal structure, neutron diffraction analysis, 11: 8284(R)

Ammonium bromine crystals

structure and temperature effects, 11: 12970(R)

Ammonium chlorides

chromatographic separation from alkali metal halides using $C_6H_5OH-CH_3OH-HCl$, 11: 4830(J)

Ammonium compounds

(For compounds with organic substituents see by name of substituents, e.g., Dodecylamine acetate.)

infrared absorption spectra of inorganic coordination complexes, 11: 9989(J)

Ammonium compounds, quaternary

crystal structure of $(N\text{-}C_3H_7)_4NBr$, 11: 1782

decomposition of p-nitrophenethyltrimethylammonium iodide by hydrogen isotope effects, 11: 6644(J)

deformation vibrations of solid, 11: 9989(J)

preparation and properties of unsaturated, 11: 9219(J)

Ammonium fluorides

heat capacity, entropy, enthalpy, and free energy, 11: 3725(J)

Ammonium iodides

crystal structure, neutron diffraction analysis, 11: 8284(R)

Ammonium ions

exchange of N between ammonia and, 11: 9664(R)

Ammonium iron(II) sulfates

radiation and temperature effects, 11: 9587(R)

radioinduced oxidation, 11: 6672(J)

radiolysis, 11: 167(J)

Ammonium nitrate–2-pentanone, 4-methyl- systems

with $UO_2(NO_3)_2$, heat, partition and density data, 11: 4356

Ammonium nitrates

mixtures with TNT and RDX, detonation velocity transients, 11: 909

Ammonium thorium oxalates

preparation of powders of uniform particle size, 11: 11056

Ammonium uranates

precipitation, effect of Na on, 11: 8264

roasting, time and temperature effects, 11: 13698(R)

roasting to remove fluorides, 11: 1494(J)

uranium recovery, effect of F^- ion, 11: 2379

Ammonium uranium fluorides

precipitation from aqueous solutions, 11: 7142(R)

Ammonium uranyl phosphates

conversion to UO_2F_2, 11: 11499(P)

Ammonium uranyl phosphates (cont'd)

conversion to UF_4, 11: 8422

conversion to UF_6, 11: 11665, 13706(R)

corrosive effects on stainless steel, 11: 9724

hydrogenation at high temperature, 11: 8422

Ammunition

statistical techniques in surveillance of ordnance, 11: 1499

Amoeba

radiosensitivity, 11: 4781(R), 12642(R)

Amplifiers

(See also Electron tubes.)

construction and operation of dielectric, 11: 5411(J)

design considerations for radiation measurements, 11: 12139

design for pulse spectrometry, 11: 4016(R)

design of a-c, for use with ionization chambers, 11: 6781

design of cathode-follower isolation, 11: 8025(R)

design of direct current, with linear or logarithmic response, 11: 6439

design of fast nonblocking linear, 11: 7292(R)

design of half-wave response magnetic, for low remanence cores, 11: 5946

design of linear, for use with ionization chambers, 11: 12797(J)

design of maser, 11: 12177(R)

design of power, with switching transistors, 11: 6442

design of 75 Kw, 11: 1964

design to prevent overcharging of interstage coupling capacitors by strong signals, 11: 3262(P)

drift, servo stabilization, 11: 2566

input tubes for low-noise pre-, 11: 6438

linear, for pulse-height spectrometry, 11: 9373(J)

for microwaves, a traveling wave gas cell maser, 11: 11346

overload characteristics of monitor, for pressure transducer, 11: 3910

space charge effects in beam-type magnetron, theory, 11: 7246(J)

transistor, design, 11: 3957

voltage-tuned, transistor, 11: 1920(R)

Amsco

See Kerosene.

Analgesics

(See also Anesthetics.)

effects of injected chlorpromazine in dogs, 11: 7398(R)

Analogs

See Circuits; Computers; Reactor simulators.

Analysis

(See also specific analyses, e.g., Chemical analysis; Colorimetric analysis.)

accuracy, principles for increasing, 11: 8841(J)

automation in chemical, review, 11: 5786(J)

chemical, of metals, alloys, gases, nonmetals, slags, and refractories, review, 11: 5787(J)

of non-ferrous metals, 11: 2837(J), 5788(J)

of water, review, 11: 5789(J)

Analyzers

See Computers; Gas analyzers; Oscillographs; Pulse analyzers; Spectrometers.

Anemia

iron metabolism in, tracer study, 11: 5136(R)

Anemia (cont'd)
pernicious, diagnosis with radiocyanocobalamin, 11: 3678(J)
radioinduced following x-ray therapy, 11: 9946(J)
Anemometers
(See also Meteorological instruments.)
improved design for portable meteorological mast, 11: 3504
Anesthetics
(See also specific compounds used as anesthetics and Analgesics.)
radiation effects on organism response, 11: 3282(J)
Animal care
buildings and facilities for housing mice, 11: 11557
Animal cells
counting and size distribution analysis, calibration of electronic instrument for, 11: 7910(R)
effects of whole-body x irradiation on peritoneal fluid and blood cells in pollen-sensitized rats, 11: 11871(J)
embryonic hematopoietic tissue, protective effects against radiation injuries in mice, 11: 8798(J)
metabolism in, effects of radiation, 11: 6611(J)
radiation effects, 11: 5144(J), 5146(J), 5170(J)
radioactivation analysis for Sn, 11: 2261
Animal metabolism
of fission products after uptake from contaminated plants, 11: 10412
Animal reproduction
effects of thyroid and parathyroid hormones in rats, 11: 4227(R)
Animals
(See also specific animals e.g., Dogs; Mice.)
carcasses of small laboratory, temporary storage of radioactive, 11: 4263(J)
irradiated, sensitivity to gas gangrene and tetanus infections, and effectiveness of sulfur prophylactics on anaerobic infections in, 11: 7913(J)
radiation dosage determinations, effect of exposure geometry on pattern, 11: 8780(J)
radioactivity levels in, of Rongelap and Ailinginae Atolls, Marshall Islands, after atomic explosions, 11: 9192
Anion exchange materials
analytical uses in determination of B, 11: 6262(J)
chemical properties, 11: 12970(R)
evaluation for separation of Sr and Cs from fission product solutions, 11: 115(J)
Anions
absorption spectra changes induced by complex formation, 11: 8267(R)
Anisole complexes
with boron trifluoride, vapor pressure, 11: 12319(R)
Annealing
theory, 11: 9611(R)
Anodes
(See also Electrodes.)
carbon, for F production cells, 11: 2288
testing for use in HF, 11: 7494
thoriated carbon, 11: 3684(J)
Anoxia
radiosensitivity effects, 11: 12960(R)
radiosensitivity effects on eggs and spermatozoa of Habrobracon, 11: 5719(J)
Anoxia (cont'd)
radiosensitivity effects on Escherichia coli, 11: 10402(J)
radiosensitivity effects on maize chromosomes, 11: 4242(J)
radiosensitivity effects on rats, 11: 9576(R)
radiosensitivity effects on tumors, 11: 11890(J), 11891(J)
tolerance levels of mammals during infancy, hypoxia, and irradiation, 11: 9193(J)
Antennas
patterns, converting to spherical coordinates, 11: 11319
Anthracene crystals
light yield of, for electrons from 20 to 160 kev, 11: 13394(J)
luminescence changes in organic solids, applications to dosimetry, 11: 9409(J)
production method for phosphor, 11: 3636(P)
scintillation counter, response to low-energy electrons, 11: 6618
scintillation response, 11: 517(J), 518(J), 5436(R)
x-ray absorption, 11: 518(J)
Anthragallol
analytical uses for U precipitation, 11: 2277
Antibiotic therapy
effectiveness, 11: 13566(R)
effectiveness against bacteremia associated with radiation sickness, 11: 886(J)
effectiveness against rickettsia, effects of irradiation in embryonate eggs, 11: 6200
effectiveness for radioinduced lung lesions, 11: 9964(J)
influence on radiosensitivity, 11: 4783, 6214(J), 11045(J)
Antibiotics
preparation, 11: 10803(R), 13565(R)
preparation from lactobacillus isolated from rat intestine, 11: 7398(R), 9576(R), 12960(R)
Antibodies
elution from insoluble antigen with urea and salicylate, tracer study, 11: 5180
formation and localization, 11: 4805, 5748
formation of, effects of ionizing radiation on, 11: 5150(J), 5151(J), 5720(J), 9925(J), 11026(J)
protective mechanisms, radiation effects, 11: 6604(J), 11022(R)
Antigens
concentration in tissues during radiation sickness, 11: 6621(J)
Antiheparin drugs
specificity measurements, 11: 6201(J), 7910(R)
physiological effects of coanesin, 11: 12960(R)
Antimony
determination in Sb–Zr alloys, 11: 2915
electron energy losses in, and its compounds, 11: 745(J)
melting temperature at pressures up to 30,000 kg/cm^2, 11: 1533, 3856(J)
proton cross sections at 900 Mev, 11: 5555(J)
separation of Nb from, by means of 8-quinolinol, 11: 13294(J)
solubility in $SbCl_3$ and SbI_3, 11: 9217(J)
Antimony alloys
thermoelectric properties, effects of Bi, Zn, Ag, and Sn content on, 11: 1175

Antimony–aluminum alloys
See Aluminum–antimony alloys.

Antimony borides
preparation and physical properties, 11: 3368(R)

Antimony–chromium alloys
atomic magnetic moments, 11: 8562(R)

Antimony–gallium alloys
radiation effects, 11: 4745(J)

Antimony hydrides
reactions with boron hydrides, 11: 3368(R)

Antimony–indium alloys
radiation effects, 11: 4745(J)

Antimony isotopes
enrichment by (γ,n) reaction, 11: 3936(J)
half lives and decay schemes, 11: 9516(J), 12855

Antimony isotopes Sb^{119}
decay scheme and internal bremsstrahlung, 11: 9517(J)

Antimony isotopes Sb^{121}
neutron activation cross sections, 11: 9752(R)

Antimony isotopes Sb^{122}
decay properties, 11: 551, 768
enrichment by atomic recoil, 11: 1975(J)

Antimony isotopes Sb^{124}
correlation between β and circularly polarized γ rays in, measurement, 11: 13485(J)
decay schemes, 11: 9161
gamma spectra, 11: 3611(J), 4042(J), 8087(J)

Antimony isotopes Sb^{128}
identification, 11: 3939(J)

Antimony isotopes Sb^{128}
isomers, 11: 3938(J)

Antimony–lead alloys
extrusion, 11: 9332(R)

Antimony–manganese alloys
magnetic structure of Mn_2Sb, 11: 10600(J)

Antimony oxides
coprecipitation of U from acidic phosphate solutions by, 11: 3221(P)

Antimony–thorium alloys
crystal structure of ThSb, Th_3Sb_4, and $ThSb_2$, 11: 945(J)

Antimony–zirconium alloys
analysis for Sb, constitution diagrams, hardness, and preparation, 11: 2915
constitution diagrams, determination of, 11: 12055
corrosion by 315°C water and phase studies, 11: 8507(R)
hardness and phase studies, 11: 12456(R)

Antineutrinos
absorption by deuterons, energy and cross section for, 11: 4028(J), 4969(J)
flux distribution from thermal reactors, 11: 4968(J)

Antineutrons
annihilation, meson emission in, 11: 4030(J), 4031(J)
annihilation in matter, 11: 2053(J)
isotopic spin, 11: 13474(J)
production from antiprotons in charge-exchange collisions, 11: 2023(J), 10233(R)
study of existence and properties, 11: 10684(J), 12183(J)

Antioxidants
performance in engine lubricants, 11: 11158(R)

Antiprotons
annihilation, charge distribution of mesons in, 11: 4030(J), 4031(J), 4628(J)
annihilation in matter, 11: 2053(J), 4622(J), 5514(J)
annihilation of, measurements, 11: 10238(J)
detection and measurement, 11: 6868(R)
interaction cross sections in complex nuclei and collision cross sections, 11: 10233(R)
interactions, optical model explanation of attenuation cross sections, 11: 13478(J)
interactions with nuclei, 11: 6550(J), 11362
isotopic spin, 11: 13474(J)
production by π mesons on nucleons and in nucleon-nucleon collisions, 11: 2057(J)
production in nuclear emulsions exposed to cosmic rays, 11: 3003(J)
reactions with protons, energy released, 11: 4027(J)
review of work at Berkeley on, 11: 3003(J)

Apatites
rare earth–Th–U bearing, occurrence in Mineville District (N.Y.), 11: 2911(J)
uranium, mode of occurrence, 11: 8915(J)
x-ray-diffraction analysis, 11: 12970(R)

APDA Reactor
See Power breeder reactors.

APPR
See Army Package Power Reactor.

Arabinose
preparation of C^{14}-labeled from D-glucose-6-C^{14}, 11: 1835

Arachidonic acid
synthesis, 11: 8258(R)

ARBOR Reactor
design proposal, 11: 4073, 12213

Archeological specimens
(See also Fossils.)
age estimations by C^{14} counting, 11: 11995(J), 11996(J)

Arco Chemical Plant
(See also National Reactor Testing Station; 25 Process.)
analytical control methods, 11: 1458, 2282, 2826, 8856, 10441
decontamination achieved with MTR assemblies vs. cooling time, 11: 11611
design considerations, 11: 3737(J)
direct-maintenance operation, 11: 194(J)
operating equipment manual, 11: 2297, 2343
operations evaluation, 11: 1232
process equipment, 11: 7479
SF materials accounting, 11: 193(J)
training program, 11: 1458

ARE
See Aircraft Reactor Experiment.

Argentina (Mendoza Prov.)
geologic, radiometric, and botanical study of the Los Chanares Zone in, 11: 13327(J)

Arginine
metabolism in rat livers, tracer study, 11: 7910(R)

Argon
α-ray induced luminenscence, 11: 8971(J)
adsorption on graphite, 11: 7959(J)
atomic distribution in liquid, studied by neutron diffraction, 11: 5548(J)
atomic structure, 11: 2091(J), 5939(J)
density of solid, at 77°K, 11: 2960(J)
diffusion and content in mica and feldspar, 11: 10542(J)
diffusion in Ag, 11: 10585
diffusion in potassium–lime–silica glass, 11: 1956
electric discharge in, at high frequencies, 11: 8064(J)
electron drift velocity in, 11: 4916(J)
equilibrium ionization behind strong shock waves in, 11: 9346(J)
impulse discharge in, electron distribution function, 11: 8063(J)
ionization yields for fission fragments, 11: 8117(R)
large angle collisions with Ar, measurement, 11: 12763(J)
light emission from α-particle stopping in, 11: 1274(R)
mean life of the $^3P_2$ metastable level, 11: 1295(J)
neutrons diffraction analysis, 11: 2027(R)
nuclear interactions of cosmic rays in, 11: 9358(J)
proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)
purification, 11: 7408(R)
radioactivity hazard from, at DIDO, 11: 10282
removal of O and N from, 11: 13582(R)
scattering in Ne atoms and scattering of Ne atoms in, 11: 742(J)
scattering of low-energy H^- ions in, 11: 9501(J)
self-diffusion at 50°C and high pressures, 11: 11292
solubility in organic solvents, 11: 5202(J)
sparking potential at low pressures, 11: 7231(J)
spectral line widths at various pressures, 11: 7238(J)
thermal conductivity of A–Kr and Ne–A mixtures, 11: 6778(J)
thermal conductometric determination in A–N systems, 11: 10000(J)

Argon–hydrogen systems
thermal conductometric analysis for H, 11: 10000(J)

Argon ions
gas ionization by positive, with formation of multi-charged ions by single collision, 11: 3201(J)
radiation effects in glass bombarded with positive, 11: 7363(J)
scattering of stripped, in gases, 11: 7349(J)
thermodynamic properties, calculation of ideal-gas, 11: 12788

Argon isotopes
abundance, upper limits, 11: 472(J)
retention of electromagnetically separated, 11: 9378

Argon isotopes Ar^{35}
decay, electron-neutrino angular correlation in positron, 11: 11384(J)
decay schemes, 11: 782(J), 7292(R)

Argon isotopes Ar^{36}
decay schemes, 11: 1542(R), 4717
energy levels from $Cl^{35}(p,\gamma)$ reaction, 11: 9143(J)
neutron transmission cross sections, 11: 5548(J)

Argon isotopes Ar^{37}
inner bremsstrahlung, 11: 1273(R)

Argon isotopes Ar^{38}
decay schemes, 11: 4717

Argon isotopes Ar^{39}
radiometric determination in air samples, 11: 7920(R)
spectra, 11: 8283(R)

Argon isotopes Ar^{40}
formation, by decay of K^{40}, 11: 13351(J)
neutron scattering cross sections, 11: 5548(J)
photoprotons from, angular distribution of, 11: 12949(J)
proton scattering by, optical model analysis, 11: 10773(J)

Argon isotopes Ar^{41}
decay schemes, 11: 779(J)

Argon–nitrogen systems
thermal conductometric analysis for Ar, 11: 10000(J)

Argonaut Reactor
design, 11: 5613(J)
design features and costs, 11: 6072
hazards summary report, 11: 4072
theoretical physics, 11: 9091

Argonne Boiling Reactor Facility
See ARBOR Reactor.

Argonne Cancer Research Hospital, Chicago
progress reports, 11: 5132(R), 13229(R)

Argonne Fast Reactor
See Experimental Breeder Reactor.

Argonne Heavy Water Reactor
characteristics and facilities, 11: 9752(R)
fuel element fabrication, 11: 8476
fuel-rod fabrication, 11: 8530
neutron flux measurements, 11: 8541(R)
operating experience and maintenance, 11: 2632(R)

Argonne Mighty Mouse Research Reactor
design study, 11: 10717

Argonne National Lab., Lemont, Ill.
environs monitoring during 1955, 11: 10173
meteorology, 1949 to 1954, 11: 6000
progress reports, 11: 7708(R), 11563(R), 11739(R)
progress reports on Argonne Neutron Production Reactor, 11: 12521(R)
progress reports on biological and medical research, 11: 4781(R), 7910(R), 12642(R)
progress reports on chemical engineering, 11: 7407(R), 7408(R), 8322(R), 9580(R), 9581(R), 13579(R), 13580(R), 13581(R), 13582(R)
progress reports on chemistry, 11: 7405(R), 7406(R), 7455(R), 8265(R), 8266(R), 8267(R), 9578(R), 9579(R), 11562(R), 11564(R), 12963(R), 13575(R), 13576(R), 13577(R), 13578(R), 13633(R)
progress reports on electrolytic refining of U, 11: 7568(R)
progress reports on environs monitoring, 11: 7291(R), 7399(R)
progress reports on Experimental Breeder Reactor, 11: 7718(R), 11743(R)
progress reports on Materials Testing Reactor project, 11: 7719(R)
progress reports on metallurgy, 11: 7626(R), 7629(R), 7630(R), 8462(R), 10887(R), 11687(R), 11688(R), 11689(R), 13763(R)
progress reports on nuclear physics, 11: 8541(R)
progress reports on particle accelerators, 11: 1355(R), 8199(R)
progress reports on physics, 11: 550(R), 2026(R), 6863(R), 7690(R), 8562(R), 9752(R), 10231(R), 11740(R)

Argonne National Lab., Lemont, Ill. (cont'd)

progress reports on reactor engineering, 11: 2632(R), 4664(R), 10921(R), 10923(R), 11744(R), 11745(R), 11746(R), 11747(R), 11748(R), 13864(R), 13866(R), 13868(R), 13869(R), 13870(R)

Argonne Neutron Production Reactor

control rod design, 11: 7708(R)

cooling system, 11: 7708(R)

design and development, 11: 12521(R)

exponential measurements, 11: 13965

fuel element fabrication and dimensional stability, 11: 7708(R)

neutron flux distribution, thermal, 11: 13863

Wilkins effect in rods and quatrefoils, 11: 13863

Argonne Power Breeder Reactor

core design, effects of corrosion, high temperature, and thermal stresses on, 11: 7839

design, analysis, and feasibility, 11: 13866(R)

design and criticality evaluation, 11: 13864(R)

fuel element design, 11: 13868(R)

fuel process loss effects on breeding gain and converting time, 11: 9788

mathematical analysis, 11: 11745(R)

plutonium quality in graphite-reflected blanket, 11: 13864(R)

Argonne Research Reactor

criticality calculations for, 11: 7707

modifications for operation at 4 Mw, 11: 4108(J)

operating manual, 11: 11390

Arikaree Formation (Wyo.)

geology, 11: 12734

Arizona

geologic map of Agathla Peak NE Quadrangle in, 11: 6729(J)

geologic map of Agathla Peak NW Quadrangle in, 11: 6728(J)

geologic map of Agathla Peak SE Quadrangle in, 11: 6730(J)

geologic map of Agathla Peak SW Quadrangle in, 11: 6732(J)

geologic map of Boot Mesa NE quadrangle in, 11: 6725(J)

geologic map of Boot Mesa NW Quadrangle in, 11: 6724(J)

geologic map of Boot Mesa SE Quadrangle in, 11: 6726(J)

geologic map of Boot Mesa SW Quadrangle in, 11: 6727(J)

uranium deposits, collected field material on, 11: 6356(R)

Arizona (Apache Co.)

uranium and vanadium ores, structural control of Monument No. 2 Mine, 11: 4443(J)

Arizona (Coconino Co.)

exploration of Cameron area in, 11: 10083

photogeologic map of Buckskin Gulch SW Quadrangle in, 11: 12043(J)

photogeologic map of Emmett Wash NE Quadrangle in, 11: 1107(J), 1109(J)

photogeologic map of Fredonia NE Quadrangle, 11: 9317(J)

photogeologic map of House Rock Spring NE Quadrangle in, 11: 1113(J), 1114(J)

photogeologic map of House Rock Spring NW Quadrangle, 11: 9321(J)

photogeologic map of Jacob Lake NE Quadrangle in, 11: 1111(J)

photogeologic map of Johnson SE Quadrangle, 11: 9318(J)

photogeologic map of Lees Ferry NE Quadrangle in, 11: 6731(J)

photogeologic map of Lees Ferry NW Quadrangle in, 11: 5868(J)

photogeologic map of Lees Ferry SW Quadrangle in, 11: 1106(J)

Arizona (Coconino Co.) (cont'd)

photogeologic map of Navajo Mountain-13 Quadrangle in, 11: 1101(J)

photogeologic map of Navajo Mountain-14 Quadrangle in, 11: 5324(J)

photogeologic map of Paria Plateau NE Quadrangle in, 11: 1116(J)

photogeologic map of Paria Plateau NW Quadrangle in, 11: 1099(J)

photogeologic map of Paria Plateau SE Quadrangle in, 11: 1108(J)

photogeologic map of Tanner Wash NW Quadrangle in, 11: 1110(J)

Arizona (Mohave Co.)

geology and U deposits, 11: 6354

photogeologic map of Fredonia NE Quadrangle, 11: 9317(J)

photogeologic map of Virgin SE Quadrangle in, 11: 1096(J)

preliminary geologic map of Hurricane Cliffs-2 NE Quadrangle, 11: 9320(J)

Arizona (Navajo Co.)

photogeologic map of Navajo Mountain-15 Quadrangle in, 11: 1102(J)

Armour Research Reactor

program, design and cost, 11: 2775(J)

Army Package Power Reactor

control rod experiments and calculations, 11: 7322, 10721, 12544, 12550, 13878

coolant pump failure effects, 11: 10275

core wall temperature, effect on coolant pressure, 11: 13875

critical mass and multiplication factor for, calculation, 11: 13872

criticality studies, 11: 13184

criticality studies and fuel element and control rod design for, 11: 13986

design, 11: 1075(J), 11443(J), 13516(J)

emergency shutdown by poisoning with B, 11: 13877

fuel element and control rod fabrication and testing, 11: 13874

fuel element radiation damage, 11: 12540

fuel element shipping, container design, 11: 12569

fuel element specifications, fabrication, and inspection, 11: 11766

fuel plate and control rod components, specifications, 11: 11429

fuel plate corrosion during cleaning, 11: 13340

fuel plate fabrication problems, 11: 12548

fuel plate imperfections, 11: 10720

gamma flux and energy distribution, 11: 6886

gamma heating in the pressure shell, 11: 6886

hot channel factors, 11: 7323

neutron flux distribution data, 11: 6885, 6886

power distribution for, 11: 13873

pressure shell thermal stresses from gamma heating, 11: 6886

pressure vessel, gamma heating effects on new, 11: 8163

shielded shipping containers for demineralizers, shield thickness calculations, 11: 8231

tolerances of plate spacing, U content in, 11: 13873

zero power experiments on APPR-1, and criticality and reactivity data, 11: 13876

Aromatic compounds

synthesis, lubricity, and other properties, 11: 11133(R)

ARR

See Armour Research Reactor.

Arsanilic acid

analytical uses for U precipitation, 11: 2277

Arsenic
activation determination in petroleum, 11: 8296(R)
determination in black oxides, 11: 1772
gamma reactions (γ,n), cross sections, 11: 12914(J)
neutron total cross sections, fast, 11: 2085(J)
nuclear spallation by protons, 11: 3100(J), 6545
separation from U by ion exchange, 11: 1018(R)
solvent extraction from process solutions, 11: 7474(R)
Arsenic compounds
aromatic, recovery of U by precipitation with, 11: 3224(P)
Arsenic isotopes
enrichment by (γ,n) reaction, 11: 3936(J)
Arsenic isotopes As^{74}
applications in external localization of brain tumors, 11: 69(J)
electron capture, 11: 8148(J)
Arsenic isotopes As^{75}
excited levels produced by $Ge^{74}(p,\gamma)As^{75}$ reaction, 11: 10310(J)
neutron activation cross sections, 11: 9752(R)
neutron reactions (n,n'), excitation of isomeric states, 11: 9189(R)
neutron resonances, 11: 6065(J), 8562(R)
quadrupole resonance in synthetic claudetite, 11: 604(J)
Arsenic isotopes As^{76}
electron capture, 11: 8148(J)
gamma spectra, 11: 3061(J), 8219(J)
spin and gyromagnetic ratio measurements, 11: 9458(J)
spin of 27-hr, 11: 11379(J)
Arsenic isotopes As^{77}
decay schemes, 11: 6866(R)
Arsenic sulfides
infrared transmission, 11: 2197
Arsonic acids
uranium precipitation by, 11: 2312
ART
See Aircraft Reactor Test.
Arthropods
laboratory culture and radiation effects, 11: 52(R)
Aryl halides
recombination of Br^{82} in, 11: 9216(J)
Ascorbic acid
analytical use in amperometric titration of V and Ce in presence of other elements, 11: 11944(J)
analytical uses, 11: 11932(J)
complexes with UO_2^{+2}, preparation, 11: 1840(J)
protective effects on protein solutions irradiated by x ray or ultraviolet rays, 11: 1807(J)
ASFR
See Submarine Reactors (S5W).
Asphalt
permeability to acid or neutralized waste and water, 11: 13644(R)
Asphaltites
removal for effective grinding of the ore, 11: 2303
Astatine isotopes
identification studies, 11: 12341(R)
Astatine isotopes At^{211}
pathological effects on rats, 11: 9916(R)
preparation, 11: 12(R)
preparation and alpha emission, 11: 3289(J)
ASTR
See Aircraft Shield Test Reactor.
Astrophysics
acceleration of cosmic radiation in solar flares, 11: 12775(J)
formation of light nuclei in expanding universe, 11: 7340(J)
motion of a gas during a star flare-up (supernova), 11: 8948(J)
nuclear reactions with Ne isotopes in stars, 11: 5379(J)
origin of elements in stars, 11: 1196(J)
physical constants in extra-galactic nebulae, 11: 3887(J)
stellar evolution, nuclear astrophysics, and nucleogenesis, 11: 11273
stellar structure equation, integration of, 11: 9752(R)
sunspots, magnetic field and current configurations, 11: 1930(J)
Atlanta District (Nev.)
geology and exploration, 11: 4863
Atlantic Ocean Beach
exploration for Th and radioactive black mineral deposits in Fla., Ga., N.C., and S.C., 11: 3825
Atmosphere
(See also Air; Meteorology; Stack disposal.)
contamination in U melt plant building, 11: 2241
contamination with Rn, factors affecting, 11: 7291(R)
determination of variation of apparent gravity with altitude in, hypsometric formula, 11: 11245
diffusion processes in, mathematical analysis, 11: 6615
fall-out data applied in measurement of movement of air masses, 11: 1264(J)
filter samplers, performance, 11: 10122
kinetic temperature of, supported by radiation, 11: 11274(J)
monitoring, contaminated with boron hydride, employing a triphenyltetrazolium chloride reagent, 11: 1187(J)
pressure factors, 11: 11245
radioactivity, effects of atomic explosions on, 11: 3645(J)
radioactivity induced by natural and artificial means, 11: 3669
radiological monitoring, 11: 6816, 6817
radon diffusion in, meteorological factors affecting, 11: 5749(J)
turbulence in layer near the ground, 11: 6488(J)
upper regions, emission studies, 11: 9353(J)
Atmosphere exposure chambers
calibration, 11: 12961(R)
design, for exposing animals to radioactive dusts, 11: 4329
design, for use with dogs, 11: 52(R)
Atomic beams
production, resonance lamp design for, 11: 8025(R)
stability of klystron for atomic beam emission spectrometer, 11: 1383(R)
Atomic clouds
age estimations, 11: 11040(J)
development, and height as a function of yield and meteorology, 11: 3643
mathematical analysis, 11: 3644
meteorological factors affecting particle diffusion in, 11: 6615

Atomic clouds (cont'd)

radiation hazards due to fall-out from, 11: 481, 3669

sampling, rocket design for, 11: 5125

scavenging of radioactive particulate matter by rain water, 11: 9957(J)

Atomic constants

survey, 11: 6425(J)

Atomic energy

(See also Atomic weapons; Nuclear power.)

bibliographies, compiled of American, British, Canadian, and Russian information, 11: 6594

development, economic aspects, 11: 10(J), 14(J)

development, role of chemistry in, 11: 1800(J)

development, role of metallurgy in, 11: 1889(J)

development for peaceful purposes, Indian fifteen year plan for, 11: 11833(J)

development for power production, 11: 7(J), 3638(P)

development for use in research, 11: 4779

development in Australia, 11: 56(J)

development in Czechoslovakia, 11: 15(J), 3273(J)

development in Germany, Sweden, Japan, Netherlands, Switzerland, and France, 11: 2775(J)

development in India, 11: 7335(J)

development in Sweden, 11: 56(J)

development in The Netherlands, 11: 11835(J), 11836(J)

development in the southern states, U.S.A., 11: 6(J)

glossary of common terms, 11: 5915(J)

impact on law, manpower, and information needs, 11: 2775(J)

industrial application in France, England, U. S., Canada, and Russia, development and problems, 11: 1717

industrial and medical applications, 11: 5(J)

industrial uses, review, 11: 3271(J)

international cooperation and future use, 11: 15(J)

major activities of AEC, book on, 11: 13226(J)

meterological and oceanography problems of, 11: 56(J)

military applications, 11: 7041(J)

peaceful use, conference in Geneva 1955, history, messages from state heads, program and lectures by 12 outstanding scientists, numerical index of papers, 11: 15(J)

peaceful use, cooperation by the United Kingdom, 11: 15(J)

peaceful uses, chemistry and technology of nuclear materials at Geneva Conference, 11: 9911(J)

peaceful uses, chemistry of processes in nuclear reactors, 11: 10308(J)

public health problems in peacetime uses, 11: 56(J), 3647(J), 5712(J), 5738(J)

radiation hazards and protection, book, 11: 8803(J)

Soviet Union assistance to other countries for development of, 11: 15(J)

training programs, 11: 14(J), 56(J)

Atomic Energy Commission, Washington, D. C.

legislation, 11: 13225(J)

major activities of, book on, 11: 13226(J)

program and policies, 11: 7(J), 1391, 4220(J), 5306

semiannual report, index to twentieth, 11: 824(J)

semiannual report for Jan.–June 1956, 11: 825(J)

Atomic Energy of Canada Ltd. Chalk River Project, Chalk River, Ont.

environs monitoring, 11: 11148

Atomic Energy of Canada Ltd. Chalk River Project, Chalk River, Ont. (cont'd)

history and summary of research program, 11: 13(J)

progress reports of Physics Div., 11: 1278(R), 2027(R), 6496(R), 9054(R)

Atomic Energy Research Establishment, Harwell, Berks, England

report lists for sale and published papers, 11: 8760

Atomic explosions

(See also sites of explosions; e.g., Hiroshima; Nagasaki; test operations, e.g., Greenhouse Operation, and Explosions; Radiological warfare.)

ballistic properties of glass fragments resulting from, 11: 2773

ballistic properties of low-velocity missiles resulting from, 11: 2774

biological hazards from Cs^{137} due to fall-out, 11: 9943(J)

biological hazards from Sr^{90} due to fall-out, 11: 884(J), 6618(J)

blasts effects, radiation injuries, and fall-out hazards, 11: 9205(J)

blast effects on mobile homes and emergency vehicles, 11: 11830

civilian protection, specifications for shelter system, 11: 4218

contribution to atmospheric C^{14}, 11: 13250(J)

dating by β-decay, 11: 10662(J)

effects on liquefied petroleum gas installations and facilities, 11: 9905

effects on machine tools, 11: 1856

effects on wholesomeness of foods, 11: 1752, 3275, 7070

fall-out forecasts, factors affecting accuracy, 11: 6213

fall-out monitoring, 11: 3480, 3689(J), 4249, 4547, 4795, 8794, 9192, 9956(J), 11040(J), 12960(R), 13247

fall-out monitoring, bibliography, 11: 51

formation of condensation nuclei following, 11: 1191(J)

at Hiroshima and Nagasaki, effects of exposure on pregnancy terminations, 11: 3294(J)

medical studies on children exposed at Hiroshima, 11: 8763

meteorological aspects, 11: 3645(J), 7905(J), 9042(J)

military applications, 11: 6593(J)

noise effects on mice in blast resistant shelters, 11: 9906

personnel shelter evaluation, 11: 7922

radiation hazards, 11: 884(J), 3295, 3307(J), 4217, 7065, 8803(J), 9205(J), 12652

radiological survey of site, 11: 9206(J), 12315

thermal radiation hazards, 11: 1403, 7065

thermal radiation measurements, 11: 7243

seismic recording of, in Australia, 11: 11831(J)

Atomic masses

effect of decay and binding energies on measurement, 11: 596

empirical equation for, 11: 10120(J)

of nuclides between Gd and Pb, equation for, 11: 596

semiempirical formula for, 11: 8138, 12856(J)

Atomic power

See Nuclear power.

Atomic structure

development, theories, 11: 3880(J)

isotope shift in atomic spectra, 11: 5498(J)

mathematical analysis, 11: 7222(J)

optimum charge distribution for computation by Bertaut's method, 11: 1461

Atomic weapon tests

See specific tests, e.g., Greenhouse operation and Atomic explosions.

Atomic weapons
(See also Atomic explosions; Radiological defense; Radiological warfare.)
bibliography on, 11: 11013
development, 11: 6593(J)
hazards and protection against fall-out, review, 11: 9951(J)
Russian book chapter on, 11: 7041(J)
Atomics International Div., North American Aviation, Inc., Canoga Park, Calif.
progress reports, 11: 9478(R), 12702(R)
progress reports on general chemistry, 11: 7429(R)
progress reports on high-temperature chemistry, 11: 4812(R), 12666(R)
progress reports on KEWB program, 11: 5026(R)
progress reports on OMRE, 11: 6087(R)
progress reports on organic reactor development, 11: 12895(R)
progress reports on physics, 11: 8942(R)
progress reports on PRE program, 11: 3757(R)
progress reports on pyrometallurgical processing, 11: 3756(R), 5261(R), 7550(R), 9639(R)
progress reports on reactor development, 11: 12239(R), 12240(R)
progress reports on reactor safety, 11: 5025(R), 9844(R), 11424(R)
progress reports on separations chemistry, 11: 7144(R), 7548(R), 7549(R), 8390(R), 10829(R), 13680(R)
progress reports on SGR, 11: 10736(R)
progress reports on sodium graphite reactors, 11: 4095(R), 13969(R)
progress reports on SRE, 11: 13503(R)
Atoms
binding energy, precision method for obtaining, 11: 6059(J)
collisions, use of complete interaction Hamiltonian for, 11: 4623(J)
collisions of, duration, 11: 4727(J)
displacement in solids, during irradiation, 11: 6426(J)
electron capture and loss phenomena, 11: 4015
energy levels, measurements of lifetime, 11: 11261(J)
energy levels and structure, group theory for studying, 11: 11254(R)
Fermi, holes in, 11: 2091(J)
Hartree potentials of neutral, and electron scattering, 11: 3188(J)
mesonic theory and x irradiation, 11: 3003(J), 5494
nuclear quadrupole coupling in, effect of atomic core, 11: 4021(J)
optimum charge distribution for computation by Bertaut's method, 11: 1461
partition function and effective ionization potential of, in the interior of a plasma, 11: 5933(J)
relationship to electron and electron shell structure, review, 11: 8036(J)
scattering, variational treatment, 11: 5055
spectra, theory of Stark effects in line broadening, 11: 793
spectral lines of A = 25 to 200, 11: 8025(R)
statistical theory of, extension to finite temperatures, 11: 5684(J)
ATR
See Submarine Advanced Reactor.
Atropine
physiological effects in rats, 11: 9576(R)
radiosensitivity effects in rats, 11: 12960(R)
Attapulgites
adsorption properties and heat of wetting measurements, 11: 11918
Auger electrons
ejection from W by noble gas ions, 11: 1294(J)
Aurintricarboxylic acid
analytical uses for U precipitation, 11: 2277
Autoclaves
See Pressure vessels.
Autonomic drugs
physiological and radiosensitivity effects, 11: 8258(R)
Autopsies
of small laboratory animals, temporary storage of radioactive carcasses, 11: 4263(J)
Autunites
chemical, optical, and x-ray data, 11: 1871(J)
discovery in granitic batholites of Montagne, France, 11: 10541(J)
Aviation personnel
(See also Nuclear aircraft.)
psychological stress due to radiation, methods for control, 11: 7048

B

Babcock and Wilcox Co. Atomic Energy Div., Lynchburg, Va.
progress reports on Liquid Metal Fuel Reactor, 11: 12214(R)
Babcock and Wilcox Co. Research Center, Alliance, Ohio
progress report on investigation of heat exchanger materials, 11: 12730(R)
Bacteremia
radiation effects on induced, 11: 851(J), 1393, 4783, 7695(R)
Bacteria
anaerobic obligate, respiration process, 11: 13227(J)
antibiotic properties of latobacilli, effect of growth factors, 11: 2237(R)
applications in U concentration using activated sludge, 11: 3374(J)
counting automatically, equipment development, 11: 12642(R)
effects of small x-ray doses on formation of immunity against typhoid fever, 11: 11028(J)
metabolism in, tracer studies, 11: 17(J)
metabolism of organic acids by Spirillum serpens, 11: 7910(R)
radiation effects on dry spores of B. subtilis, 11: 11867(J)
radiosensitivity, 11: 33(J), 828(R), 1733(J), 1734(J), 5736(J), 7054(J), 9976(J)
radiosensitivity of Nocardia corallina, 11: 11856(J)
Bacteriophages
radiosensitivity, protective effects of cysteine, 11: 4252(J)
sensitivity to ultraviolet radiation, 11: 9912
Balances
design and performance, 11: 13093(R)
design and performance of microchemical, 11: 11103
design of automatically recording, 11: 4544(R), 5338
micro-, remote controlled quartz-fiber, fabrication of components, 11: 458
Bald Mountain Area (Wyo.)
exploration, geology, mineralogy, and monazite deposits, 11: 5316
Ball mills
for enriched U, criticality studies, 11: 7901

Balloons

for cosmic-ray studies at 80,000 to 105,000 feet, 11: 5457(J)

Baltic Sea Basin

geochemistry of U in, 11: 4869(J)

Barite concretes

preparation and shielding properties, 11: 2766

shielding properties, 11: 2762, 7857(R)

shielding properties and homogeneity of test wall, 11: 2762

Barites

properties for reactor shielding, 11: 2766

Barium

activity transfer in Na-cooled, stainless steel systems, inhibition by, 11: 3818(J)

adsorption by LaF_3 or MnO_2, 11: 7520

adsorption on cation exchange resins, 11: 12328(R)

bone deposition in humans, 11: 12637(J)

diffusion from irradiated U-impregnated graphite, 11: 12982

gravimetric determination in Zr and Zr salts, 11: 5780

ion exchange behavior on Dowex-50, 11: 5276(J)

ion exchange purification, 11: 9659

polarographic determination in ThO_2, 11: 8296(R)

radiochemical separation, 11: 179

removal from radioactive waste solutions, 11: 1026

separation from Ra by fractional crystallization, fractional precipitation, and ion exchange, 11: 12328(R)

tissue distribution in rats, tracer study, 11: 9209(J)

Barium carbonates

mass spectrographic analysis, 11: 11698

Barium chloride–lithium chloride systems (liquid)

electrolytic recovery potentials at 500 to 700°, 11: 8021(J)

Barium chloride–potassium chloride–uranium(III) chloride systems (liquid)

electrolysis for production high-purity U, 11: 7568(R)

Barium chlorides

corrosive effects on stainless steel, 11: 4163

fused, for U refining, 11: 3226(P)

Barium compounds

ferroelectric properties of solutions of $BaSnO_3$ in $BaTiO_3$, 11: 262(J)

formation and high-temperature properties of $BaO \cdot 3BeO$, $2BaO \cdot 3BeO$, and $BaO \cdot Beo$, 11: 4428(J)

Barium fluorides

phase studies of UF_3–BaF_2 system, 11: 7101(J)

Barium isotopes

chemical effects on tissues and metabolism in animals, 11: 7055(J)

coulomb excitation levels, 11: 12068(R)

isotopic analysis with aluminum ion emitter, 11: 126(J)

Barium isotopes Ba^{128}

formation, 11: 13197(R)

Barium isotopes Ba^{130}

neutron activation cross sections, 11: 12973(R)

Barium isotopes Ba^{133}

preparation and physical properties, 11: 7291(R)

Barium isotopes Ba^{135}

gamma spectra from Coulomb excitation, 11: 6865(R)

Barium isotopes Ba^{137}

conversion electron spectra, 11: 3608(J)

gamma spectra from Coulomb excitation, 11: 6865(R)

Barium isotopes Ba^{139}

yield in thermal neutron fission of U^{235}, 11: 12254(J)

Barium isotopes Ba^{140}

buildup in Th breeder reactors, 11: 1373

decay schemes, 11: 9161

diffusion from U-impregnated graphite, 11: 7711

production, plant design and process development, 11: 12390

production of 140 curie batches, 11: 11733(R)

purification following ion exchange separation, 11: 9659, 11607(R), 12400

radiochemical determination in nonirradiated U salts, 11: 4396

separation and filtration-precipitation from La^{140}, 11: 2866(J)

separation by wet precipitation, equipment, 11: 7705

separation from spent reactor fuel assemblies, 11: 7556, 9625, 13206

Barium oxide–silicon oxide systems

phase equilibrium diagram and refractory properties, 11: 4856

phase studies, 11: 10527(J)

Barium oxides

electron-bombardment-induced dissociation, 11: 8217(J)

Barium sulfates

coprecipitation with Ra, 11: 2862(J)

emanation using Te^{132}, 11: 2838(J)

nephelometric determination, 11: 3704(J)

precipitation, 11: 11607(R), 11801(R)

solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)

Barium sulfides

gaseous species in equilibrium at high temperatures, 11: 10231(R)

Barium titanate crystals

charge development, dielectric constant, resistance, and dielectric strength, 11: 2554

dielectric properties, 11: 7225(J)

microstructure, 11: 5855

neutron radiation effects, 11: 7364(J)

piezoelectric constants in, effect of temperature on, 11: 2555

Barium titanate–lead titanate systems

physical properties, 11: 10075(J)

Barium titanates

breakdown voltage, 11: 261(J)

differential thermal analysis equipment for temperatures to 1575°C, 11: 11172

electromechanical behavior in the Curie zone, 11: 13320(J)

ferroelectric properties of solutions of $BaSnO_3$ in, 11: 262(J)

magnetic susceptibility vs temperature, 11: 1922(R)

neutron-diffraction study of orthorhombic, 11: 5389(J)

preparation and properties of solid solution of, 11: 1066(J), 1071(J)

solid solutions of $Ba_{0.5}NbO_3$ and $Ba_{0.5}TaO_3$ in, dielectric properties, 11: 10074(J)

thickness vibrations in, 11: 2540

Barium uranates

thermal decomposition, 11: 13576(R)

Bartol Research Foundation, Swarthmore, Penna.

progress reports, 11: 4854(R), 6866(R)

Bartow clay
See Florida leached zone material.

Basal metabolism
(See also Metabolism.)
in rats, effects of large doses of radioactive iodine, 11: 842(J)

Baths
See Liquid baths.

Battelle Memorial Inst., Columbus, Ohio
progress reports, 11: 2311(R), 2313(R), 2315(R), 2316(R), 2317(R), 8010(R), 12317(R), 12360(R)
progress reports on alloys, 11: 8492(R)
progress reports on civilian applications, 11: 9711(R), 13779(R)
progress reports on cracking in high strength weld metals, 11: 5327(R)
progress reports on metallurgy, 11: 7656(R), 7657(R), 8484(R), 12473(R), 13782(R)
progress reports on metallurgy of uranium, 11: 7658(R), 7659(R), 7660(R), 7662(R), 9737(R), 11657(R), 13221(R), 13788(R), 13789(R), 13790(R)
progress reports on molybdenum and molybdenum base alloys, 11: 13339(R)
progress reports on polymerization studies, 11: 2844(R), 7092(R)
progress reports on properties of alloys, 11: 8491(R)
progress reports on recovery of Th and U from monazite sands, 11: 2327(R), 7571(R), 8328(R)
progress reports on rhenium, 11: 300(R)
progress reports on titanium metal and alloys, 11: 1134(R), 3850(R), 3853(R)
progress reports on U ore processing, 11: 2380(R), 7470(R), 7471(R), 7472(R), 7473(R), 7474(R), 8327(R), 8329(R), 8330(R)
progress reports on U recovery, 11: 2305(R), 2310(R), 2324(R), 2325(R), 2381(R)
progress reports on U recovery from acid leach solutions, 11: 2318(R)
progress reports on U recovery from phosphate rock, 11: 2319(R), 2326(R)

Batteries
(See also Nuclear batteries; Solar batteries; Storage batteries.)
design of Kapitza-type Ni–Cd, 11: 4401(R), 4402(R), 4403(R), 4404(R), 4405(R), 6414(R)
formation by irradiation of semiconductors, 11: 4777(P)

Bavaria
uranium occurrence, 11: 10086(J)

Baylor Univ., Waco, Texas
progress reports on titanium chemistry, 11: 5756(R), 6229(R)

Beams
See under specific accelerators, specific reactors, and main headings, e.g., Alpha beams; Charged particle beams; Deuteron beams.

Bear Valley District (Idaho)
geology, mineralogy, and exploration, 11: 3821

Bearing materials
cemented tungsten, bonding against steel, 11: 2476
compatibility in liquid Na alloy and Na, 11: 2447
corrosion, 11: 13985(R)
corrosion and wear resistance of carbon graphite, 11: 6343
effect of metallurgical factors on the life of, efficiency, mechanical and chemical properties, 11: 340(J)
fundamental behavior in sliding contact, 11: 2477
gold and gold alloy, testing, 11: 2891, 13792
lubrication and wear resistance, 11: 2453
for pumps, screening, 11: 3800

Bearing materials (cont'd)
testing, 11: 11806(R)
testing, for use in Submarine Thermal Reactor primary cooling pumps, 11: 2455(R)
testing of Al_2O_3 and WC coatings on ThO_2 slurry pump, 11: 8900
testing of Graphitor in UO_2SO_4 under reactor conditions, 11: 8708(R)
testing under reactor conditions, 11: 4421(J)
tungsten coatings for, carbidization, 11: 11573(R)
wear and friction in 200 to 500°F water, 11: 5303
wear resistance, corrosive effects of HNO_3 and uranyl nitrate on, 11: 7616
wear resistance, for water-cooled reactor applications, 11: 12028

Bearings
(See also Journal bearings.)
air-lubricated, mathematical analysis, 11: 7168(J)
anti-friction, lubrication, and performance, 11: 1184(R)
design of boron carbide, 11: 11174
dry friction tests of thrust, at various speeds, 11: 1049
friction and wear properties of Carboloy, 11: 13153
liquid metal lubricated, testing, 11: 2422, 2446, 2447
lubrication in absence of liquid lubricants, 11: 4420, 9211(R), 12668(R)
performance in high-temperature Na, 11: 6521(R)
spiral groove thrust, mathematical analysis of thrust, 11: 2885
testing Al_2O_3, 11: 12465(R)
testing carbon graphite, 11: 6343
testing in liquid metals, 11: 13149(R)
testing of ball, 11: 13868(R)
water-lubricated, testing, 11: 1049, 2453
wear in NaK circulating systems, 11: 10921(R)
wear measurement, tracer techniques, 11: 7173(J)

Beaver Creek Placer Area (Idaho)
exploration, geology, and mineralogy, 11: 3822

Behavior
biochemical factors affecting, in rats, 11: 4814(R)
effects of irradiation on, of rats, guinea pigs, and hamsters, 11: 4228
effects of psychological stress in military personnel exposed to radiation, 11: 7048

Belen–Bernardo Area (N. Mex.)
geophysical exploration, 11: 11191

Belgian Congo
age estimation of pitchblendes in, 11: 2906(J)
geology of the Nairi Basin and Boko-Songo Valley in, 11: 1081

Bellows
(See also Valves.)
corrosion of Homogeneous Reactor Test core vessel transition joint and expansion bellows mock-up, 11: 10529
failure in Submarine Intermediate Reactor, 11: 6897
mounted with O-ring seals, 11: 1511
testing of proposed Submarine Intermediate Reactor in Na, 11: 4920
testing of transition joint for Homogeneous Reactor Test reactor vessel, 11: 8911
welds in Submarine Intermediate Reactor Na stop valve, evaluation for leaks, 11: 3554

Bentonites
(See also Montmorillonites.)
plastic limit and liquid limit versus saturating cation for, 11: 1008(J)

Benzene

bubble growths in superheated, 11: 5763

hydrogen exchange between, derivatives and DBr, 11: 1793(J)

preparation of C^{14}-labeled, 11: 3330(R), 4814(R)

radiation chemistry of aqueous solutions, 11: 11574(R)

radiation effects, 11: 4163, 11566(R)

radiolysis by γ, 11: 8284(R)

radiolysis with α particles, 11: 11576(R)

substituted, preparation of tritium-labeled, 11: 5132(R)

turbine cycle, thermodynamic investigation, 11: 1041

Benzene, alkyl-

radiation effects, 11: 12984, 12985

Benzene, methyl--acetic acid--water systems

See Acetic acid--benzene, methyl--water systems.

Benzene, nitro-

valence vibrations in substituted, 11: 1490(J)

Benzene, nitro--acetic acid--water systems

See Acetic acid--benzene, nitro--water systems.

Benzene, trifluoro-

proton and fluorine spin-lattice relaxation times, 11: 1650(J)

Benzenearsonic acid, o-2(hydroxy-3, 6-disulfonaphthylazo)-, sodium salts

analytical use with meso-tartaric acid in spectrophotometric determination of Th, 11: 7953(J)

analytical uses in spectrophotometric determination of U, 11: 4829(J)

Benzoic acid

radiation effects, 11: 12970(R)

radiolysis of aqueous solutions, 11: 11574(R)

Benzoic acid, 3,5-dibromo-4-hydroxy-

decarboxylation, isotope effect in, 11: 8286(R)

Benzoic acid, o-benzoyl-

condensation reactions, isotope effect in, 11: 8286(R)

Benzopurpurin

analytical uses for U precipitation, 11: 2277

Benzoyl peroxide

thermal decomposition, mechanism, 11: 5365(R)

BEPO

design and operation, 11: 591(J), 2135(J), 4654, 4658, 5569, 6525

neutron transmission in straight annular ducts through shielding, 11: 8176

BER

See Experimental Boiling Water Reactor.

Berkelium

solvent extraction of Bk^{4+} from HNO_3 solutions into n-heptane--di(2-ethyl hexyl) orthophosphoric acid, 11: 11137(J)

Berkelium isotopes

nuclear properties, 11: 13443

Berkelium isotopes Bk^{249}

spontaneous fission energy release, calculated, 11: 13444

Beryllates

of calcium, Sr, Ba, Mg, Zn, Co, and Ni, formation and high-temperature properties, 11: 4428(J)

Beryllium

activities found in high nvt irradiated, 11: 13207

activities found in shim rod, effect of impurities at fabrication, 11: 1328

Beryllium (cont'd)

aerosols, detection, 11: 2806(J), 10804

alloying qualities for light metals, 11: 8012(J)

amalgamation by electrolysis of fused salt by Hg electrode, 11: 10576(J)

analysis for BeO, 11: 1429(R)

analysis for O_2, N_2, and H_2, 11: 4308(J)

antiproton interactions with nuclei, 11: 10710(J), 11362

atomic structure, 11: 3713(J)

book on the general properties, 11: 4473(J)

brazing of tubes to high-temperature alloy collars, 11: 3837

castings, 11: 7328(R), 8473, 11690(R)

colorimetric determination, 11: 123(J), 124(J), 935(J)

compacting powder for extrusion, 11: 8520(R)

corrosion, 11: 13805(R)

corrosion, effect of Al, Fe, and Si on, 11: 7680

corrosion, fabrication, production, properties and radiation effects, 11: 12474

corrosion by high-temperature water, 11: 3807, 3808, 7665(R), 8705(R)

corrosion by liquid Na, 11: 227, 3398, 10736(R), 13564(R)

corrosion by simulated reactor cooling water, 11: 7619, 8460

corrosion by sodium chloride solutions at 70°C, 11: 7664(R)

corrosion by water, 11: 13597(R)

corrosion inhibition by Fe, 11: 8519(R)

creep at 1700°F and 28.7 psi, 11: 8473

cross sections, 11: 13197(R)

crystal structure of extruded, 11: 8519(R)

density of extruded, 11: 8519(R)

determination, 11: 13277(J)

determination in ores, 11: 12406(R)

determination of microquantities, 11: 8791(R)

deuteron inelastic scattering cross sections at 190 Mev, 11: 8735(R)

deuteron reactions, 11: 4709(J), 13197(R)

deuteron reactions (d,n), 11: 8722, 8726, 9778, 9886(R), 14018

ductility, effects of O_2 on, 11: 8519(R)

ductility, rolling, stress, extrusion, and tensile properties, 11: 7681(R)

ductility and corrosion resistance, 11: 11715(R)

electrodeposition, 11: 1898(J), 3864(J)

electron-diffraction analysis, 11: 7430(R)

electron energy loss and straggling at 150 Mev, 11: 4152(J)

extrusion, 11: 7664(R), 7665(R), 8515(R)

extrusion, fabrication, and powder metallurgy, 11: 8525(R)

extrusion and pressing, 11: 9729(R)

extrusion and tensile properties at high temperatures, 11: 7666(R)

extrusion of finned tubes, 11: 7631(R)

extrusion of rods from powders, 11: 8519(R).

fabrication, mechanical properties, and preferred orientation, 11: 7683(R)

fabrication by powder metallurgy, 11: 9730(R), 11692(R)

fabrication of rods from sintered, 11: 7631(R)

fabrication of shim rod, effect of impurities, 11: 1328

fabrication of tubes, 11: 7659(R)

fabrication of tubes and washers, 11: 9729(R)

fabrication of washers, 11: 7631(R)

fabrication of windows for permanently evacuated x-ray tubes, 11: 1544

fluorometric determination, 11: 2243(R), 3695

Beryllium (cont'd)
formation in solar atmosphere, mechanism, 11: 8192(J)
friction coefficients on U and Ti, 11: 10092
gamma reactions, 11: 697(J), 700(J), 4115, 5655(J)
grain structure, effects of various treatments on, 11: 2921, 2922
handling, hazards and safety precautions, 11: 12657(J), 13567, 13571(R)
heat generation in, and γ activity of, 11: 7719(R)
hot working, crystallite formation and growth during, 11: 8516(R)
mechanical properties, literature survey, 11: 8477
mechanical properties of reactor grade, at elevated temperatures, 11: 1875
melting, 11: 13805(R)
melting, bottom-pour vacuum furnace for, 11: 8515(R)
melting and casting, impurity pickup in, 11: 8515(R)
meson(π^-) interactions, 11: 4133(J), 12830(J)
microstructure, rupture, and purification by zone melting, 11: 8518(R)
mineral containing $Na_2BeSi_2O_6$ identification, 11: 285(J)
moderating properties, 11: 682(J)
neutron activation, for reactor flux measurements, 11: 12519
neutron reactions, 11: 550(R), 682(J), 1277(R), 2174(J), 3035(J), 3510, 3577, 4016(R), 4709(J), 6489, 12913(J), 13209
neutron resonances, 11: 11739(R)
neutron total cross sections, 11: 11739(R)
nuclei in cosmic radiation, 11: 3448(J)
optical anisotropy, 11: 8517(R)
powder metallurgy, 11: 2495(R), 2497, 2508, 2526, 2949(R), 8519(R), 13095(R), 13788(R)
preparation, fabrication, phase studies, and alloy properties, 11: 12486
production, sintering, and purification, 11: 203(J)
production by electrolysis of $BeCl_2$, 11: 6587(P)
production by fluoride extraction from beryl, 11: 13095(R)
production by reduction of the halides and oxides, 11: 1538(J), 2290(R), 2517(R), 2518(R), 2519(R), 2520(R), 2521(R), 2522(R), 7021(P), 9750
proton, deuteron, He^3, and α scattering cross sections, 11: 10996(R)
proton reactions, 11: 612(J), 3541(J), 4601(J), 5057, 5989(J), 6142(J), 6493
proton reactions (p,n), 11: 8722, 13197(R)
purification, 11: 13805(R)
radiation effects, 11: 1276(R), 12963(R), 14031(R)
radiographic inspection, 11: 8515(R)
reactions with Ga, effects of U on, 11: 8461
reactions with steam, 11: 12963(R)
recovery from slag by HCl leaching, 11: 12322(R)
reduction, 11: 11700(R), 13083(R)
self-diffusion at 1000°C, 11: 12555(R)
separation from Al, Ti, and Fe by ion exchange, 11: 9260(J)
separation from bone, rock, and Cu^{2+} by ion exchange, 11: 7974(J)
separation from bronze, Al and other elements by solvent extraction, 11: 200(J)
sintering, effect of pressure, 11: 2496
spectrographic determination, 11: 4283, 5218(J), 5221(J)
spectrophotometric analysis for Na, Li, and K, 11: 10813(R)
temperature distribution and thermal stresses, 11: 6382(R), 13046
tensile, creep, and stress-rupture properties, 11: 8495(R)
tensile properties, 11: 9332(R), 13805(R)
testing and physical metallurgy, 11: 8515(R)
thermal conductivity, literature survey, 11: 4877
thermal shock resistance, 11: 8517(R)
toxicology, 11: 4781(R)

Beryllium alloys
analysis, 11: 9737(R)
electrodeposition from organic solutions, 11: 3864(J)
extrusion and rolling, 11: 11698
powder metallurgy and tensile properties, 11: 13095(R)
structure of binary intermetallic compounds, bibliography, 11: 4879
tensile properties, 11: 8525(R)

Beryllium–aluminum alloys
See Aluminum–beryllium alloys.

Beryllium–aluminum compacts
See Aluminum–beryllium compacts.

Beryllium–beryllium carbide systems
development for high-temperature use, 11: 4464(R)
high-temperature strengthening by dispersion of hard particles, 11: 5360(J)

Beryllium–beryllium oxide systems
development for high-temperature use, 11: 4464(R)
mechanical properties, 11: 10890, 11711(R)
tensile properties and internal defects, 11: 12490(R)
testing, for fuel element moderator applications, 11: 13734

Beryllium carbide–beryllium systems
See Beryllium–beryllium carbide systems.

Beryllium carbide–graphite systems
radiation effects, 11: 13203(R), 13204(R)
radiation effects on elastic properties and electric conductivity, 11: 8740(R), 8741(R)

Beryllium carbide–uranium carbide systems
phase studies, 11: 7694(R)

Beryllium carbides
chemical, physical, and mechanical properties, 11: 5856
radiolysis by α particles, 11: 2300

Beryllium chlorides
reduction, 11: 8525(R)
reduction by Mg, 11: 2518(R)
reduction by Na, 11: 2290(R), 2521(R), 2522(R)

Beryllium compacts
cold pressed, effect of sintering on density, 11: 2496
fabrication, 11: 11690(R)
tensile properties, 11: 13095(R)

Beryllium compounds
preparation of di-t-butylberyllium, 11: 10439(J)

Beryllium–copper alloys
cryogenic data, 11: 386
embrittlement by H_2 of cold-worked, 11: 1532(J)
radiation effects, 11: 8747(R)
radiation effects on supersaturated solid solutions, 11: 5886
recrystallization and aging, temperature effects and phase studies, 11: 1156(J)

Beryllium–copper compacts

preparation and tensile properties, 11: 2526

Beryllium crystals

plastic properties, hot-compression crystal deformation x-ray and metallographic studies, 11: 1205(J)

preparation and diffraction analysis, 11: 12490(R)

single, formation and plasticity, 11: 8517(R)

Beryllium fluoride–lithium fluoride–sodium fluoride systems

viscosity, 11: 13613

Beryllium fluoride–potassium fluoride–sodium fluoride systems

viscosity, 11: 13613

Beryllium fluoride–potassium fluoride systems

viscosity, 11: 13613

Beryllium fluoride–rubidium fluoride systems

phase studies, 11: 10527(J)

Beryllium fluoride–sodium fluoride systems

vapor pressure and equilibrium, 11: 9240

Beryllium fluoride–sodium fluoride systems (liquid)

corrosive effects, 11: 7664(R)

viscosity from 580 to 800°C, 11: 13611

Beryllium fluorides

colorimetric analysis for F_2, 11: 2290(R)

polymorphism, thermographic and x-ray investigations, 11: 3349(J)

preparation, 11: 13083(R)

reduction, 11: 8525(R)

reduction to Be, 11: 2290(R), 2517(R), 2519(R), 2521(R), 2522(R)

reduction with magnesium, 11: 9750

vapor pressure and equilibrium, 11: 9240

Beryllium hydrides

preparation, 11: 9329, 10439(J)

Beryllium–hydrogen systems

crystal structure, 11: 13805(R)

Beryllium hydroxides

x-ray spectra, powder, 11: 12666(R)

Beryllium iodides

dimorphic modifications of BeI_2, 11: 6640(J)

Beryllium ions

detection, 11: 125(J)

hydrolysis, study of, by electrometric titrations, 11: 1422(J)

yield from solid target under bombardment by gaseous ions, 11: 6863(R)

Beryllium ions (recoil)

spectra, 11: 550(R)

Beryllium–iron alloys

phase studies, 11: 8515(R)

solubility limits and diffusion of Fe in solid solutions of, 11: 12738

Beryllium isotopes Be^7

cosmic-ray production rate, 11: 1933(J), 5499(J)

energy levels, shell model interpretation, 11: 12206(J)

snow content of, produced by cosmic radiation, 11: 6762

spin-orbit coupling in, 11: 9752(R)

Beryllium isotopes Be^8

energy levels, 11: 550(R), 580(J), 591(J), 752(J), 3095(J)

radiative transition widths in the lp shell, 11: 9456(J)

Beryllium isotopes Be^9

alpha reactions (α,n), angular properties, 11: 2152(J), 5048(J)

deuteron reactions, 11: 2166(J), 3095(J), 5040, 6116

deuteron reactions (d,d2n) and proton reactions (p,p2n), excitation functions, 11: 14020(R)

deuteron reactions (d,p)Be^{10} and (d,t)Be^8 at low bombarding energies, proton angular distributions, 11: 10765(J)

deuteron reactions (d,n), energy spectrum of neutrons from, 11: 6838(J)

electron scattering, 11: 6560(J)

energy levels, 11: 1302(J), 1542(R)

gamma reactions (γ,n) at intermediate energies, cross sections, 11: 4120(J)

helium nucleus and neutron reactions, 11: 7713

helium nucleus reactions (He^3,p), differential cross sections, 11: 1277(R), 3048(J)

lithium ion reactions (Li^7,p), 11: 4125(J)

neutron reactions (n,α), cross section, 11: 550(R), 4113, 4572(J), 4973, 10324(J)

neutron reactions (n,2n), cross section, 11: 12196(J)

nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)

proton reactions (p,d), 11: 1680(J), 3043(J), 3087(J), 4132(J)

x rays, proportional counter measurements of π-mesonic, 11: 12172(J)

Beryllium isotopes Be^{10}

deuteron reactions (d,p), angular distribution and correlation studies, 11: 6116

formation, 11: 1345(J)

radioactivity, 11: 8264

Beryllium minerals

prospecting in U. S. and Canada for, 11: 3411(J)

Beryllium-moderated reactors

(See also specific beryllium moderated reactor, e.g., KAPL Intermediate Power Breeder; Submarine Intermediate Reactor.)

control problem and critical size, 11: 12574

criticality studies, 11: 1618(R), 2675

design of Russian, 11: 5618(J)

neutron leakage, 11: 1655

thermal neutron spectrum, calculations, 11: 8187(J)

Beryllium–nickel alloys

corrosion, 11: 11715(R)

heat treatment, 11: 1922(R)

microstructure and rupture, 11: 8518(R)

radiation damage, "temperature-spike" concept of, 11: 6013(J)

radiation effects on supersaturated solid solutions, 11: 5886

radiation-induced irreversible changes in, 11: 8013(J)

solubility limits and diffusion of Ni in solid solutions of, 11: 12738

Beryllium nitrides

production, 11: 9750

Beryllium ores

fluorimetric analysis for Be, 11: 3695

Beryllium oxide–beryllium systems

See Beryllium–beryllium oxide systems.

Beryllium oxide–calcium oxide systems

phase diagram study, 11: 13582(R)

Beryllium oxide compacts

bend strength, crystal size, and density of sintered, 11: 12317(R)

fabrication of high-density round and rectangular sections, 11: 7179

Beryllium oxide crucibles
contamination of molten Th by, 11: 12493
fabrication, 11: 13589
preparation, 11: 8487(R), 11690(R)
Beryllium oxide films
structure and crystallization, 11: 1783(J)
Beryllium oxide–niobium systems
metallurgical properties, tensile properties, thermal expansion, and thermal shock, 11: 3388
Beryllium oxide powders
calcination, effect on properties, 11: 9711(R)
fabrication of rocket nozzles, by hot pressing, 11: 10524
sintering, 11: 6713, 7179
surface area measurements, 11: 12473(R)
x-ray spectra, 11: 12666(R), 12971(R)
Beryllium oxide–uranium oxide systems
physical properties of sintered, 11: 7601
thermal conductivity, effects of radiation damage and annealing on, 11: 14030
Beryllium oxide–uranium(IV) oxide systems
thermal expansion from 0 to 400°C, 11: 9743
Beryllium oxides
(See also specific beryllium oxide systems, e.g., Beryllium–beryllium oxide systems.)
casting, 11: 13805(R)
cermets of, properties, 11: 8517(R)
chemical, physical, and mechanical properties, 11: 5856
chemical reactions with steam, atomic gases, and free radicals, 11: 8264
crystal structure, 11: 1452
determination in Be metal, 11: 1429(R)
extrusion of tubes, 11: 8472
extrusion of tubes and cylindrical rods, 11: 8473
fabrication, 11: 13805(R)
fabrication of rocket motor nozzles, by hot pressing, 11: 8908
interfacial reactions with Ce and La, 11: 2851
metallurgical properties, tensile properties, thermal expansion, and thermal shock, 11: 3388
microstructure, effects of hot pressing on, 11: 8908
neutron slowing down time and diffusion constants in, 11: 9435(J), 9436(J)
production of reactor grade, 11: 5832(J)
radiation effects, 11: 7405(R), 11562(R), 12963(R)
reactions with steam, free radicals, and atomic gases, 11: 11562(R)
reduction by Ca, 11: 1158(J)
separation from U oxide mixtures, 11: 8515(R)
sintering, 11: 13805(R)
spectral analysis by evaporation method, 11: 6288(J)
temperature distribution and thermal stresses, 11: 8683, 13046
testing, for fuel element moderator applications, 11: 13734
thermal conductivity, 11: 8472, 13415(J)
thermal expansion, 11: 12794
thermal neutron diffusion length and neutron diffusion constants, 11: 682(J)
Beryllium oxides (impregnated)
thermal conductivity, effects of radiation damage and annealing on, 11: 14030
Beryllium–oxygen systems
crystal structure, 11: 13805(R)
Beryllium–polonium alloys
preparation and crystal structure, 11: 3413
Beryllium powders
explosive limits, handling, safety, and toxicology, 11: 6741
extrusion and fabrication, 11: 8518(R), 9730(R)
powder metallurgy, fabrication of finned tubes and washers, 11: 11691(R)
pressing at and below sintering temperatures, 11: 9750
purification by acid leaching, 11: 5877
sintering, 11: 2494(R), 2495(R), 5877
x-ray-absorption analysis for BeO, 11: 12971(R)
Beryllium–silicon systems
microstructure and rupture, 11: 8518(R)
Beryllium sulfate–uranyl sulfate–water systems
corrosive effects on stainless steel, 11: 6348(R)
stability, 11: 12465(R)
Beryllium sulfates
inhaled, effects on lungs of rats, 11: 2805(J)
Beryllium–thorium alloys
corrosion by boiling distilled water, 11: 7664(R)
Beryllium–uranium alloys
creep strength at 1500 to 1800°F, 11: 12630
fabrication and phase equilibria, 11: 8495(R)
physical properties of UBe_{13}, 11: 13092
powder metallurgy, 11: 12496
structure of extruded, 11: 8515(R)
thermal conductivity, 11: 14031(R)
Beryllium–uranium compacts
critical mass and size for homogeneous mixtures Be and U^{235}, 11: 1276(R)
fabrication by powder metallurgy, 11: 2496, 9730(R), 11692(R)
powder metallurgy, effect of sintering on density, 11: 2496
production by blending attritioned Be and U powders, 11: 9730(R)
Beryllium–uranium–zirconium alloys
high-temperature reactions with water, 11: 3834(R), 13574(R)
Beryls
analysis, ion exchange methods in, 11: 9260(J)
beryllium extraction by fluorination, 11: 13095(R)
spectrographic analysis for Ce and Ru, 11: 11933(J)
Bessel functions
analysis of the zeros, 11: 2591
basic formulae useful in calculating reactor critical size, 11: 2143(J)
evaluation, Oracle code for, 11: 4562
Beta decay
angular correlations in, 11: 1699(J), 1708(J)
Coulomb corrections in allowed transitions, 11: 12272(J), 12273(J)
Coulomb effects in inner bremsstrahlung of, 11: 12939(J)
coupling constants, 11: 1621(J)

Beta decay (cont'd)

detection by photographic film, nonconservation of parity, 11: 12155(J)

electron polarization in, 11: 11291(J), 12293(J)

emission of light positive particles in negative, 11: 2192(J)

empirical regularities in, comparison with predictions of nuclear models, 11: 3602

experiments on double, 11: 3601(J), 5499(J)

interactions, experiments for determination, 11: 4960(J), 4961(J), 5673(J), 8136(J), 8239(J)

kinematics of, in weak interactions, 11: 12850(J)

neutrino interaction in, theory, 11: 12935(J)

of neutrons, 11: 591(J)

nuclear charge distribution effects on β-γ directional correlations, 11: 8220(J)

parity and electron polarization Møller scattering, 11: 11385(J)

parity conservation in, 11: 579(J), 4971(J), 13520(J)

parity nonconservation in, 11: 5502(J), 6496(J), 8154(J), 9144(J), 10236(J), 12937(J)

theory, 11: 776(J), 6019(J)

time reversal invariance in, possible tests, 11: 6989(J), 10783(J)

Beta particles

(See also Electrons; Fission; Positrons.)

absorption, 11: 750(J), 2254(R), 2750, 7236(J)

applications in processing commercial products, technical and economic aspects, 11: 3873

backscattering, application in measurements of particle diffusion in liquids, 11: 7273(J)

backscattering from gases, 11: 11465(J)

biological effectiveness, compared with α particles, 11: 3289(J)

biological effects, 11: 6624(J)

biological effects compared with effects of γ radiation in mice, 11: 6609(J)

biological effects of, from P^{32} ingested by Drosophila, 11: 4240(J)

biological effects on bacteria, 11: 1733(J)

biological effects on mice, 11: 869(J)

biological effects on yeast, 11: 2242(R)

biological effects on yeast compared with effects of α particles, 11: 8257(R)

bremsstrahlung produced by, circular polarization, 11: 8127(J), 8128(J)

cutaneous effects, 11: 11877(R)

detection and measurement, 11: 1579, 1980, 1988(J), 1989(J), 2243 2610, 2978, 3946, 4388, 7920(R), 8888

detection and measurement, counting thick samples on heavy backings, 11: 13838(R)

detection and measurement, design of a scintillation detector for, 11: 2599, 2985(J), 2986(J)

detection and measurement, design of combined α, β, γ hand and shoe monitor, 11: 3956

detection and measurement, design of high-range β-γ survey instrument, 11: 3953

detection and measurement, design of pocket ionization chamber for, 11: 7264

detection and measurement, design of well counter, 11: 1589(J), 4566

detection and measurement, energy dependence of, 11: 8791(R)

detection and measurement, performance of liquid-scintillation counters, 11: 7271(J)

detection and measurement, performance of pocket ionization chambers, 11: 12156(J)

detection and measurement by absolute counting by 4π coincidence method, 11: 8296(R)

Beta particles (cont'd)

detection and measurement from surface-adsorbed tritium, 11: 2598

detection and measurement from weak samples by liquid scintillation counting, 11: 10647

detection and measurement in biological materials, from Sr^{90}, 11: 6612, 6613

detection and measurement in contaminated soil and plants, 11: 11082

detection and measurement in gases, 11: 8792(R)

detection and measurement in human body by Bremsstrahlung emission, 11: 9026(J)

detection and measurement in presence of γ radiation, 11: 10171

detection and measurement in tritiated water when mixed with liquid scintillator, 11: 8082

detection and measurement of, from injected C^{14}-labeled morphine in man, 11: 10423

detection and measurement of, from Sr^{90} in biological materials, 11: 3690

detection and measurements of, in normal human blood, 11: 1437

directional correlations, 11: 12104(J)

dosage determination, 11: 11894(J)

dosage determination, method of calculating, 11: 11858(J), 12812

dosage determinations, comparison of calculated and measured, 11: 12812

dosage determinations for air-borne contamination, 11: 2238

dosage determinations for $BaS^{35}O_4$ deposited in lungs of rats, 11: 1726(J)

dosage determinations for mixed $Sr^{90}-Y^{90}$ in bone of young rabbits, 11: 2983(J)

dosage determinations for respiratory $C^{14}O_2$, 11: 896

dosage determinations on skin, 11: 827(J), 4567

dosimetry, equipment, 11: 520(J), 3968(J)

effects on emission spectra of propane–air flames, 11: 12696(J)

effects on erythrocytes, 11: 1400

effects on light emission from water, 11: 1371

effects on protein metabolism, 11: 3664(J)

effects on rate of propagation of propane–air flames, 11: 12695(J)

heating of Homogeneous Reactor Test core tank by, 11: 7803

interaction theory, 11: 9368(J)

interactions, backscattering in organic compounds, 11: 8206(J)

interactions with matter, relative backscattering, 11: 8205(J)

ion pair production by, absolute energy for, 11: 12764(J)

longitudinal polarization, 11: 12785(J)

measurement of correlation between, and circularly polarized gamma radiation in Co^{60}, Zr^{95}, and Sb^{124}, 11: 13485(J)

oxidation of $FeSO_4$ solutions by H^3, 11: 11564(R)

pathological effects of, from inhaled tritium in mice, 11: 19

pathological effects of, from multiple intravenous injections of Au^{198} colloids in dogs, 11: 4784(J)

pathological effects on blood picture in hemorrhaging rabbits, 11: 3284(J)

pathological effects on cardiac function, 11: 5132(J)

pathological effects on sheep, 11: 9950(J)

pathological effects on skin of, from fall-out from thermonuclear explosion, 11: 832

pathological effects on thyroid gland in rats, 11: 9918(J)

penetration range, method for calculating, 11: 13390(J)

Beta particles (cont'd)
study with nuclear emulsions, 11: 10590(J)
tumors induced by continuous exposure to, in rats, 11: 37(J)
Beta shielding
effectiveness for $Sr^{90}-Y^{90}$ sources, 11: 6574(J)
Beta sources
(See also Electron sources.)
calibration, 11: 3211(J), 3316(J), 3479(R), 6571
cost factors, 11: 3873
design and calibration, 11: 7920(R)
design using Co^{60} thin film, 11: 11522(P)
preparation employing radiolutetium, 11: 4262(J)
preparation for industrial and clinical uses, 11: 520(J)
preparation for spectrometers by electrophoretic deposition, 11: 3622(J)
preparation from Ac and Eu, 11: 1995(J)
preparation of colloidal Au^{198}, 11: 2802(J)
preparation of high activity, design of evaporation crucibles for, 11: 3918(J)
preparation of krypton^{85}, 11: 8792(R)
preparation of resorbable material filled with an insoluble compound of a short-lived β-emitting isotope, 11: 3319(J)
preparation of Sr^{90} for therapeutic uses, 11: 4258(J)
preparation of thin, by evaporation and cathode sputtering, 11: 1925(R)
preparation of Tl^{204} activated clay particles, 11: 7051(J)
preparation of Y^{90}, 11: 1758(J), 3320(J), 6624(J)
Beta spectrometers
coincidence, 11: 1272
combination γ-, design, 11: 8088(J)
construction and testing, 11: 13838(R)
correcting coils for, calculations, 11: 4947(J)
design and performance of a thin magnetic lens, 11: 1255(J)
design and focusing problems of $\sqrt{2\pi}$, 11: 2027(R), 2976, 3482
design of an inexpensive, 11: 12971(R)
design of double-focusing, 11: 797(J)
design of double-lens, with improved annular focusing, 11: 8086(J)
design of high-resolution, 11: 5975(J)
design of intermediate-image for detecting electron pairs, 11: 3973(J)
design of iron-free, for electron-electron coincidences, 11: 8999
design of large permanent magnet, 11: 1990(J)
design of lens-type pair, 11: 7455(R)
design of longitudinal field, with spherical aberration compensated by transverse magnetic field, 11: 10182(J)
design with thick emulsion for recording conversion electron spectra, 11: 3608(J)
disk source line shapes and intensities for homogeneous magnetic field, 11: 4592(J)
focusing, 11: 3216(J)
focusing in fixed field-variable radius, 11: 1272
focusing of high-dispersion two-directional, 11: 7270(J)
focusing of spiral, 11: 3498(J)
gamma spectrum measurements in Compton, 11: 4579(J)
light yield of anthracene detector in, for 20 to 167 kev beta particles, 11: 13394(J)
performance, 11: 11333(J)
Beta spectrometers (cont'd)
resolving power of long lens magnetic, 11: 6840(J)
self-delayed coincidence circuit for, 11: 7405(R)
source preparation, design of platinum crucibles for, 11: 3918(J)
source preparation, electrophoretic deposition, 11: 3622(J)
Beta spectroscopy
low-energy techniques, 11: 11562(R)
molecular, review, 11: 4755(J)
proportional counters for low energy, 11: 3967(J)
source preparation from Ac and Eu, 11: 1995(J)
Betatrons
absorption of bremsstrahlung emissions of, in two-layer absorber, 11: 3202(J)
alternating gradient oscillations, electromechanical analog design for study of, 11: 3119
applications in cancer therapy, 11: 59(J), 61(J), 11895(J)
beams, energy measurements, 11: 4726(J)
bremsstrahlung γ radiation intensity dependence on injection parameters, 11: 10333(J)
collimating system for, 11: 721(J)
design of billion electron volt, on principle of the synchrotron, 11: 12251(J)
design of mega-gauss, 11: 7346
design of two-chamber 10-Mev, 11: 3184(J)
design to study focusing in FFAG accelerators, 11: 3128, 3136, 3137, 3157, 3158
electron capture in, 11: 8201(J), 12920(J)
electron motion in ideal, effect of radiation reaction, 11: 3127
electron motion in magnetic field of, mathematical analysis, 11: 11458(J)
energy calibration, determination of $C^{12}(\gamma,n)$ threshold as, 11: 1600(J)
nonstationary circulating current from electron injections in, 11: 10332(J)
radiation sickness induced by exposure to beam from 10-Mev, 11: 887(J)
source for high resolution neutron velocity spectrometer, 11: 10370(J)
Bethlehem Steel Co. Shipbuilding Div., Quincy, Mass.
progress reports, 11: 3646(R)
Bevatrons
beam induction electrodes, 11: 6785
beam monitoring, 11: 3180
beams, production of secondary, 11: 718, 4723
development and operation, 11: 15(J), 3157(R), 3180, 3185(J), 3590, 4724(R), 6942, 8568(R), 13530
magnet, effect of internal beam deflecting, 11: 3180
targets, absorption of antiprotons in liquid H, 11: 3180
Bianthrone
radiation effects, reversible color modifications, 11: 7131
Bibliographies
on air sampling vs. flow rate (14 references), 11: 3445
on aluminum, 11: 7082(J)
on analytical chemistry of Nb and Ta, 11: 7109
on atomic energy, 11: 6594
on atomic power for aircraft and missiles, 11: 9123(J)

Bibliographies (cont'd)

on binary intermetallic compounds of Li, Na, K, and Rb, 11: 1878

on boiling heat transfer, 11: 4412(R)

on boiling water reactors, 11: 11403

on cermet development, 11: 10073

on Cherenkov radiation and its applications, 11: 6492

on controlled thermonuclear processes, 11: 12900

on corrosion by chlorine, 11: 280(J)

on corrosion products on Al, Pb, Pb alloys, Ag, Sn, Sn alloys, and Mg, 11: 12031(J)

of corrosion products on stainless steel, Zn, Zr, Ti, Fe, and steel, 11: 3817(J)

on creep, for structural engineers, 11: 255

on Crocker 60-in. cyclotron, 11: 12280

on damping mechanical vibrations, 11: 6749

on deuterium and tritium compounds, 11: 11998

of diaminoethanedionedioxime, 11: 2813

on diffusion of metals into oxides, 11: 3832(R)

on electrolysis of fused salts, 11: 12665

on electromagnetic pumps and flowmeters, 11: 6345

on enriched U fuel materials, 11: 2226

on fast neutron reactions, nuclear status, neutron spectra, and nuclear systematics, 11: 5488

on fatigue crack detection methods, 11: 1053

on feed materials, 11: 10049

on fluorine, 11: 7956

on fluorine analysis, 11: 3342(R)

on geology of U-bearing coal and carbonaceous shale in the U.S., 11: 11189

on geology of U-bearing phosphorites, 11: 11190

on geology of U-bearing phosphorites in the U. S., 11: 13330(J)

on grain-refining effects of vibratory treatment of metals, 11: 2921

on hafnium and Zr, 11: 6736

on health physics, 11: 7921

on heat transfer, 11: 4849

on heat transfer in static granular beds, 11: 10058

on heterogeneous, light water moderated reactors, 11: 9089

on hydrogen solubility in metals, 11: 4878

on infrared optical systems, radiation, and spectroscopy, 11: 6691

on infrared radiation, 11: 11258

on ion exchange resins, 11: 10035

on light scattering by colloidal systems, 11: 6761(J)

on liquid metal fueled reactors, 11: 6883

on liquid metals, 11: 1127

on mercury toxicity, 11: 12656

on metallographic investigations of In alloys in relation to position in periodic system, 11: 1530(J)

on modification of radiation injuries by chemical and biological preparations, 11: 7923(J)

on nuclear warfare, 11: 11013

on photoconductivity, 11: 4491

on pitting in ferrous systems, 11: 11186

on polarographic literature from 1922 to 1955, 11: 11946(J)

on power and test reactors, 11: 5592

Bibliographies (cont'd)

on preparation, properties, and alloying behavior of Th, 11: 10427

on pressure die-casting equipment, 11: 3415

on radiation effects, 11: 6959, 11470, 11471

on radiation effects on electronic and electrical components, 11: 12289

on radiation effects on polymers, adhesives, and polymerization, 11: 8857

on radiation effects on solids, 11: 1370, 5667

on radiation protection, 11: 7067

on radiological laboratory design, 11: 7067

on radiometric analysis of biological materials, 11: 6656

on reaction kinetics of deuterium and tritium compounds, 11: 1789

on remote-control equipment, 11: 3908

on rhenium, 11: 11222

on Russian mathematics, 11: 10169(J)

on Soviet astronautics, 11: 13359

on surface hardening of Ti and Ti alloys, 11: 6380

on swimming pool reactor designs, 11: 12587

on syntheses with carbon isotopes, 11: 10043

on the field of cryogenics, 11: 6748

on thermal conductivity measurements of solids, 11: 1031

on thermal properties of Cr, Cu, graphite, Mo, and Ta, 11: 331

on thermal properties of metals, 11: 5872, 6362

on thermal shock and fatigue, 11: 2935

on thermonuclear reactions, 11: 5393

on thorium, unclassified report literature, 11: 1525

on thorium and rare earth deposits, 11: 11188

on titanium welding, 11: 6383

on titrimetric determination of sulfate, 11: 2828

on tritium properties and analysis, 11: 3952

on uranium, physical metallurgy, 11: 5703

on uranium–molybdenum fuel element program, 11: 11731

on uranium solvent extraction processes, 11: 6695

on uranium thermal conductivity, 11: 7155

on waste processing and disposal, 11: 11175

on zirconium, 11: 2512

Big Buck Mine (Utah)

mining methods and costs, geology and exploration, 11: 3819

Big Creek Placer Area (Idaho)

exploration, geology, and mineralogy, 11: 4437

Big Generostee Creek Area (S. C.)

exploration, geology, mineralogy, and monazite placer deposits in, 11: 5315

Big Indian Wash Area (Utah)

geochemical prospecting by use of leachable U in, 11: 12736(J)

geology and mineralogy, 11: 1084(J)

Bikini Atoll

environs monitoring following Operation Redwing, 11: 5965

Binding energy

precision method for obtaining atomic, 11: 6059(J)

Biochemistry

ion exchange in, book, 11: 11127(J)

Biological materials

radiometric analysis, 11: 46, 1379(J), 1433(J), 1606(J), 3690, 10194(J)

Biological materials (cont'd)
radiometric analysis, bibliographies, 11: 6656
radiometric analysis for S^{35}, 11: 13275(J)
radiometric analysis for Sr^{90}, 11: 6612, 6613
radiosensitivity effects, 11: 7923(J)
radiosterilization of homograph materials, design of Co^{60}-γ source for, 11: 3616(J)
Biological models
steady state reactions in, mathematical analysis, 11: 1412
Biological systems
radiation effects, a review of target and hit theories, 11: 12644
tracer distribution kinetics, analog device for study, 11: 8818(J)
Biology
handbook of biological data, 11: 4222
Biology conferences
on photosynthesis, held in Moscow, U.S.S.R., Jan., 1957, 11: 10393(J)
on radioactive isotopes in agriculture held at Michigan State University Jan., 1956, 11: 4804
on radiobiology, held at Cambridge, England, August 14 to 17, 1955, 11: 45(J)
on therapy of radioelement poisoning, held at ANL Oct. 20 and 21, 1955, 11: 893
on uses of isotopes and radiation in agricultural research, held at Wageningen, Netherlands, Dec. 1956, 11: 11903
Biometry
application in studies on genetic effects of radiation, 11: 3294(J)
mathematical analysis of target theory data, 11: 4243(J)
punched card methods for vital and health records, 11: 12635
statistical analysis of factors affecting reproduction in microörganisms, 11: 4781(R)
Biophysics
auditory cortex response to acoustic stimuli, 11: 8025(R)
communication in, 11: 1920(R), 13358(R)
communications, research programs, 11: 5369(R)
Biosynthesis
possibility of naturally occurring, radioactivity-induced process, 11: 6191(J)
Biphenyl
chemical properties, corrosive effects, heat transfer, physical properties, radiation stability, 11: 12228
corrosive effects, 11: 2898, 13870(R)
corrosive effects and decomposition at 800°F, 11: 3783(R)
corrosive effects on crystal bar Zr, 11: 13752
corrosive effects on reactor materials, 11: 227, 4407(R), 5310
coolant and moderating properties, 11: 2898, 6922(J), 7724, 11745(R), 11916, 13864(R)
density as function of temperature, 11: 3027
explosibility in air, 11: 79
fast and thermal neutron diffusion lengths as function of temperature, 11: 3027
heat transfer burnout limits, 11: 6324
melting points and viscosities of mixtures, 11: 3558
physical properties, 11: 12239(R)
radiation effects, 11: 3558
radiation effects and thermal stability, 11: 9610, 10926(R), 12331(R), 13868(R)
radiation effects on mono-isopropyl, 11: 11956
solvent properties for H_2O, 11: 78
Biphenyl (cont'd)
as thermodynamic fluid in heat engines, 11: 5844(J)
toxicology and flammability, 11: 65
Biphenyl, isopropyl-
chemical properties, corrosive effects, heat transfer, physical properties, 11: 12228
corrosive effects on crystal bar Zr, 11: 13752
corrosive effects on reactor materials, 11: 4407(R)
corrosive effects on Zr, Hf, and other metals, 11: 4431
radiation effects on, as organic coolant, 11: 11956
solubility of CO_2, ethane, H, N, methane, and O in, at atmospheric pressure and temperatures to 125°C, 11: 5406
stability, decomposition products, corrosive effects on structural materials, effects of radiation on, 11: 5190
Biphenyl, isopropyl- —water systems
corrosive effects on structural materials, 11: 5309
infrared absorption analysis for water content, 11: 5309
Biphenyl—metal systems
neutron age in biphenyl—Zr and biphenyl—stainless steel, 11: 13856
Biphenyl moderated reactors
See Organic moderated reactors.
Biphenyl—phenyl ether systems
thermal properties, 11: 8688(R)
toxicology and flammability, 11: 65
Biphenyl—stainless steel systems
neutron age in, 11: 13856
Biphenyl—terphenyl systems
chemical properties, corrosive effects, heat transfer, physical properties, 11: 12228
Biphenyl—water systems
corrosive effects on structural materials, 11: 5309
infrared absorption analysis for water content, 11: 5309
Biphenyl—zirconium systems
neutron age in, 11: 13856
Birds
radiation effects on pigeons and chicks, 11: 12642(R)
Bismuth
anion exchange separation from Pb^{207m}_{Bi}, 11: 1002(J)
colorimetric analysis for Ag, 11: 2830
complex formation in dilute HCl solutions, 11: 13595
cooling properties for fast reactors, 11: 8682
corrosive effects on Cr, U carbide, Si-coated U, and Fe—U alloys, 11: 7655(R)
crystal formation in fused mixtures of, and $BiClO_3$, 11: 11068(J)
crystalline structure changes under 30,000 atm., x ray studies, 1204(J)
determination in Bi—U alloys, 11: 11095(J)
deuteron, He^3, and α scattering cross sections, 11: 10996(R)
fission by 450-Mev protons, angular distribution of particles from, 11: 12765(J)
flame photometric analysis for Cs, 11: 6252
fused hydroxide extraction, 11: 8387(R)
gamma reactions, 11: 704(J), 3186(J)
heat of dissociation and vapor pressure, 11: 7212
hydrolysis in $HClO_4$ solution, ultracentrifugation, 11: 914(J)
interaction of 14-Mev neutrons with, neutron emission probabilities from, 11: 12913(J)

Bismuth (cont'd)

ion exchange from nitrate solutions, 11: 9587(R)

magnetic field dependence of magnetoresistance and Hall potential, 11: 7889(R)

magnetic properties at low temperatures, effects of uniform compression on, 11: 12768(J)

neutron capture cross sections, 11: 11739(R)

neutron cross sections, 11: 10229, 12194

neutron production from cosmic-ray interactions in, 11: 687(J)

neutron scattering cross sections, 11: 1683(J), 10231(R), 11740(R), 12195

neutron scattering spectra, 11: 1683(J), 2022(J), 3035(J), 3592, 10910

neutron transmission, 11: 10686(R), 11740(R)

photoneutron yields, 11: 4130(J)

polarographic determination in Pu-bearing solutions, 11: 12346

proton fission and cross sections, 11: 1279(J), 2742

proton reactions (p,n), 11: 9495(J), 13836(R)

protons scattered at 96 Mev by, energy spectrum, 11: 612(J)

radioactivity induced in, by reactor irradiation, 11: 13200

separation from U by thioacetamide precipitation, 11: 5820(J)

separation from U with tributyl phosphate, 11: 10038(J)

shielding properties, 11: 4772(P)

solvent partition in acetylacetone, 11: 11123

ultracentrifugation in perchlorate solution, 11: 914(J)

vapor pressure measurement of solid, 11: 8028(J)

Bismuth (liquid)

absorption by graphite, 11: 7446, 12214(R)

corrosive effects, 11: 7691(R), 8446, 8578

corrosive effects on construction materials, 11: 8444

corrosive effects on U and steel, 11: 11656(R)

corrosive effects on V and other container materials, 11: 12490(R)

distillation of polonium from, 11: 11979

fission-product decontamination by $BiCl_3$ reaction, 11: 9640

mass transfer, design of centrifugal pump for, 11: 2895

mass transfer of V in, 11: 8524(R)

neutron-diffraction patterns of, and atomic distribution, 11: 2620

neutron transmission, 11: 1273(R), 7292(R)

solubility of Cu in, 11: 3866(J)

solubility of Fe in, 11: 13885(R)

solubility of Fe, U, and Cr in, 11: 7734(R)

solubility of Th in, 11: 13884(R)

solubility of U in, 11: 2933(J), 13965

static corrosion of metals and alloys by, 11: 9747

status of Po–Bi distillation unit, 11: 11917

Bismuth alloys

reactions of metals in, 11: 13763(R)

spectrographic analysis for Mo, Be, Fe, and Ni, 11: 4283

thermoelectric properties, effects of Zn, Ag, Sn, and Sb content on, 11: 1175

volumetric analysis for Ce, 11: 11937(J)

Bismuth bromides

preparation and properties of $BiBr_3$, 11: 11924(J)

studies on Bi sub-bromide, 11: 11067(J), 11069(J)

Bismuth–cadmium–indium alloys

phase studies and consideration as reactor poison, 11: 5025(R)

Bismuth chlorides

chronopotentiometric determination in LiCl–KCl systems at 450°C, 11: 2834(J)

crystal formation in fused mixture of, and Bi, 11: 11068(J)

research on the subchloride, 11: 11067(J), 11926(J)

Bismuth chlorides (liquid)

decontaminating agent for Bi coolant, 11: 9640

Bismuth complexes

with acetylacetone, solvent extraction behavior, effects of EDTA on, 11: 3763(J)

with chloride ions, absorption spectra, 11: 13595

Bismuth cooled reactors
See Liquid metal cooled reactors.

Bismuth iodides

detection of subiodides, 11: 11066(J)

vapor pressure of BiI_3, 11: 7710(R)

Bismuth ions

hydrolytic polymerization, 11: 9587(R)

Bismuth isotopes

applications in radiotherapy of tumors of the hematopoietic system, 11: 891(J)

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

formation and decay scheme, 11: 891(J)

proton reactions (p,xn), cross sections, 11: 688(J), 689(J)

thermal neutron cross sections, review, 11: 10245

Bismuth isotopes Bi^{205}

decay of, energy levels of Pb^{205} studied by, 11: 2068(J)

gamma decay, 11: 9052(R)

Bismuth isotopes Bi^{206}

energy levels, 11: 10699(J)

excited levels from Po^{206} decay, 11: 10255(J)

Bismuth isotopes Bi^{207}

beta spectra and conversion coefficients, 11: 11333(J)

Bismuth isotopes Bi^{209}

fission by high-energy particles, 11: 12078(J)

neutron activation cross section, 11: 13868(R)

neutron activation resonance integral, 11: 4630

neutron transmission, 11: 8562(R)

photofission cross sections from 150 to 500 Mev, 11: 6880(J)

Bismuth isotopes Bi^{211}

alpha spectra and decay scheme, 11: 12933

Bismuth isotopes Bi^{212}

Auger electron spectrum, 11: 1949(J)

beta spectrum, 11: 11373(J)

branching ratio, 11: 3051(J), 5374(J)

internal conversion coefficients, 11: 558(J), 4174(J)

preparation of radiochemically pure, extracted method for, 11: 199(J)

Bismuth isotopes Bi^{213}

alpha branching, 11: 13576(R)

decay schemes, 11: 7455(R)

Bismuth isotopes Bi^{214}
beta ray at 2.56 Mev, scintillation counter search for, 11: 3539(J)
decay, low intensity transitions in, 11: 6968(J)
decay to Po^{214}, investigation by β-γ and e^--β coincidence measurements, 11: 5674(J)
energy levels, β-transition between Pb^{214} and, 11: 625(J)
internal conversion coefficients for Ml transitions, 11: 4174(J)
Bismuth–lead alloys (liquid)
corrosive effects on construction materials, 11: 8444
graphite, penetration by, 11: 7446
heat transfer coefficients for flow in externally heated annuli, 11: 6323
solubility of Th in, 11: 13884(R)
solvent properties, 11: 13790(R)
Bismuth–lead–thorium alloys
phase studies, 11: 7691(R), 7734(R), 13885(R)
Bismuth–lead–thorium alloys (liquid)
phase studies, 11: 13885(R)
Bismuth–lead–tin alloys (liquid)
corrosive effects on construction materials, 11: 8444
Bismuth–lead–uranium alloys
phase studies, 11: 13883(R)
Bismuth–manganese alloys
structure and magnetic properties, 11: 1540
Bismuth–palladium alloys
superconducting properties, effects of uniform compression, 11: 380(J)
superconductivity, x-ray and metallographic studies of, 11: 10571(J)
Bismuth Phosphate Process
concentration, decontamination, and pre-extraction treatment, progress report, 11: 7515(R)
coprecipitation of rare earths with $BiPO_4$, 11: 7460
critical mass studies for, 11: 8372
decontamination studies, 11: 8360(R), 8368(R), 13633
development and chemical flowsheets, 11: 3367(J)
extraction and decontamination of Pu in, 11: 11620(R)
influence of hydrazine on extraction step, 11: 9622
metal solution, extraction, crossover, and decontamination, 11: 7518(R)
metal solution and pre-extraction, Pu valence states in, 11: 13685(R)
metal solution using Ce^{4+} and $K_2Cr_2O_7$, 11: 13024(R)
plutonium purification in, manual on, 11: 7464
pre-extraction and decontamination step modifications, 11: 8361(R)
product carrying under Hanford conditions, 11: 8360(R)
reduction of Pu with $H_2C_2O_4$ with Mn ions as catalyzer, 11: 7519
solvent extraction of Pu with hexone, 11: 7522(R)
thorium oxalate extraction, decontamination in, 11: 8362
uranous oxalate precipitated in, 11: 7519
waste, physical and chemical properties, 11: 7596
waste decontamination by carrier precipitation and adsorption on solids, 11: 187
Bismuth phosphates
coprecipitation with Nb^{5+}, 11: 8363(R)
coprecipitation with Pu^4 ions, 11: 7420
coprecipitation with rare-earth phosphates, 11: 7460
Bismuth phosphates (cont'd)
coprecipitation with trivalent rare earths, 11: 12370
fluorination, 11: 11563(R)
precipitate formation studies, 11: 7419
solubility in HNO_3, effects of acid concentration on, 11: 13587
Bismuth–polonium alloys
distillation rate of Po from, 11: 5880
Bismuth–rhodium alloys
structure of α, x-ray determination, 11: 379(J)
Bismuth–tellurium systems (liquid)
electrocapillary phenomena in, investigation of, 11: 13349(J)
Bismuth–thorium alloy slurries
development research, 11: 12214(R)
preparation and particle formation during thermal cycling, 11: 13885(R)
Bismuth–thorium alloys
crystal structure, 11: 11279(J)
dispersion in liquid Bi and Pb–Bi, 11: 7691(R)
distribution of Pa in irradiated, 11: 7734(R)
effects of ultrasonic energy applied to, 11: 10111(R)
phase studies, 11: 13885(R)
preparation and properties, 11: 13083(R)
preparation of, dispersions from electrolytic Th, 11: 8016(J)
preparation of dispersions of ThBi in liquid Bi, 11: 4464(R)
Bismuth–uranium alloy slurries
properties and effect of thermal gradients on, 11: 1854(J)
Bismuth–uranium alloys
analysis for Bi and U, 11: 11095(J)
circulation in Mg–Th loops, 11: 2420(R)
colorimetric analysis for U, 11: 4302(J)
constitution diagrams and microstructure, 11: 2933(J)
crystal structure, 11: 4810(R)
flame photometric analysis for Cs, 11: 6252
lanthanum separation from, 11: 9983(R)
phase equilibria, 11: 8490
phase studies, 11: 8495(R), 13885(R)
spectrographic analysis for Mo, Be, Fe, and Ni, 11: 4283
thermodynamic properties, 11: 10747(J)
Bismuth–uranium alloys (liquid)
corrosion of Croloy in, 11: 7734(R, 13884(R)
corrosion tests and purification, 11: 13883(R)
corrosive effects and heat transfer characteristics, 11: 7710(R)
fission product removal from, 11: 8331
fission product removal from, process design using fused-salt extraction, 11: 13517(J)
fuel recovery loops for, 11: 7710(R)
phase studies, 11: 13080
rare earth fission product removal, 11: 8331
static corrosion of metals and alloys by, 11: 9747
Bismuth–zirconium alloys (liquid)
corrosive effects on steel and Croloy, 11: 8445
Bitter Creek Group (Colo.)
geology, mineralogy, zoning, 11: 4445(J)

Black sands

prospecting for, in Alaska and northwestern, western, and southeastern U.S., 11: 3825

spectrophotometric analysis for Th using iodate precipitation, 11: 6263(J)

Black sands (Idaho)

occurrence in Bear Valley District, radiometric and petrographic analysis, 11: 3821

Black shales

(See also Bituminous shales; Carbonaceous shales; Oil shales.)

processing of Chattanooga uraniferous, 11: 9273(J)

Bladder

urinary, radiologic treatment of tumors, 11: 3317(J), 3672(J)

Blast effects

bibliography, 11: 4484

biological effects of blast noise on mice, 11: 9906

influence on infections in mice, 11: 5128

influence on survival of irradiated mice, 11: 5131(J)

low-velocity missile damage, 11: 2773, 2774

on machine tools, measurement, 11: 1856

photographic techniques applicable to biological phenomena, 11: 1924

physiological, 11: 2237(R), 9576(R)

pulmonary edema produced by, 11: 12960(R), 12961(R), 13565(R)

Blind River Area(Ontario)

uranium deposits in, 11: 7996(J)

Blood

centrifugation for the preparation of concentrates of undamaged leukocytes, 11: 10392

determination of Mn in, by activation analysis, 11: 1779(J)

morphological examination, sample preparation, 11: 833

natural radioactivity of normal human, 11: 1437

radiation effects on cholinesterase level, 11: 3281(J)

radiation effects on hyaluronidase and hystamine content in, 11: 9929(J)

radiation effects on iron and lipoprotein levels, 11: 7695(R)

radiation effects on plasma Fe and hemoglobin values in rabbits, 11: 12961(R)

radiation effects on toxin formation, 11: 831

radioinduced changes in, 11: 7056(J)

radiometric analysis, 11: 1778(J), 9576(R)

removal of radioelements by artificial kidneys and ion-exchange resins, 11: 4255(J)

Blood cells

(See also Blood platelets; Erythrocytes; Leukocytes.)

changes in, of mice treated by protective agents before irradiation, 11: 5737

Blood circulation

determination by radiometric counting of injected Na^{24}, 11: 9207(J), 11908(J)

effects of whole-body x irradiation in rats, 11: 5142(J)

Blood coagulation

chemical factors, 11: 2776, 13565(R)

radiosensitivity, 11: 888(J), 3274(R), 4839(J)

Blood picture

alterations in personnel exposed to small doses of ionizing radiation, 11: 2236, 3304(J)

effect of diagnostic dental radiography, 11: 5135

effects of gamma rays from 20-Mev betatron and Co^{60} on, of rabbits, 11: 30(J)

Blood picture (cont'd)

following induced leukopenia in dogs, 11: 826

physiological factors affecting granulocyte distribution, 11: 12642(R)

radioinduced alterations in, of hemorrhaging rabbits, 11: 3284(J)

radioinduced changes in experimental animals, 11: 853(J), 3274(R)

radioinduced pathology in blood picture of dogs, effects of, 11: 11876

radioinduced production of binucleated lymphocytes in man, 11: 9936(J)

radiosensitivity of leukocyte count following continuous exposure to low dose γ irradiation in mice, 11: 12641

Blood plasma

chromatographic analysis for lipids, 11: 1431

creatinine levels following irradiation of rats, 11: 12640

iodine^{131} clearance rate in cardiac patients, 11: 6627(J)

iron^{59} clearance rate as an indication of radiation damage, 11: 6600(J)

iron concentration, effects of irradiation in burros, 11: 8258(R)

iron concentration in, effects of radiation in rabbits, 11: 2233(R)

lipoprotein, effects of irradiation, 11: 7398(R)

lipoprotein levels following irradiation in rats as determined chromatographically, 11: 108

magnesium content of, effects of x irradiation on, in burros, 11: 2237(R)

radioinduced hyperferremia in rats, 11: 11847(J)

Blood platelets

counting method, 11: 6596(R)

radiosensitivity, 11: 854(J), 888(J)

Blood pressure

radioinduced changes, 11: 5724(J), 7398(R), 8259(R), 9937(J)

Blood serum

analysis for amino acids, 11: 911

chromatographic separation, 11: 1777

glycoprotein levels in chick embryos, 11: 11939(J)

nitrogen and lipide content in chicks, 11: 12961(R)

radioinduced changes in nucleic acid content, 11: 6603(J), 10399(J)

radioinduced changes in protein chromatographic behavior, 11: 11849(J)

radioinduced changes in protein sedimentation characteristics, 11: 11848(J)

radioinduced chemical and biological alterations, 11: 29(J), 839(J), 1725(R), 2788(J), 4237(J), 8259(R), 10396

Blood transfusions

continuous cross-transfusion, design of pump for, 11: 9937(J)

therapeutic effects in radiation sickness, 11: 2801(J)

Blood vessels

radioinduced complex polysaccharide globules in, of dogs, 11: 5730(J)

Blood volume

determination, tracer technic, 11: 7926(J), 12960(R)

effects of whole-body x irradiation on, in splenectomized dogs, 11: 11872(J), 11873(J)

radiation effects on, in chicks, 11: 7910(R)

Blowers

(See also Compressors; Pumps.)

design of ion, for elimination of static electricity, 11: 13371(J)

Blue Bird Claims (Nev.)

exploration, geology, and uranium occurrence, 11: 4863

Bluff Quadrangle (Utah)

photogeologic map, 11: 1098(J)

Bob Cat Claims (Wyo.)

geology, 11: 12734

Bodies
See Antibodies; Ceramic bodies.

Body armor
See Protective clothing.

Body water
volume determination in sheep, 11: 5134(R)

Boilers
(See also Water boiler neutron sources.)
applied loading, evaluation of codes for, 11: 8890
circulation rates and over-all temperature driving forces, 11: 6707(J)
cracking of forced-circulation, from liquid metal heat transfer facility, 11: 3789
density of water-vapor mixtures in, determination, 11: 11169(J)
design and testing, 11: 6700(R)
design and testing for the 3000 kw for S2G reactor, 11: 227(R), 3783(R)
design and testing of miniature B and W, 11: 4407(R)
design considerations for submarine, 11: 7833
design of forced recirculation, 11: 11526(P)
force distribution calculations, 11: 3785(J)
heat transfer, prediction of pressure loss and density factors for two-phase annular, 11: 9278
interaction with reactor, 11: 6812(J)
metallurgical examination of, 11: 13711
radiation induced corrosion, inhibition by Na_2SO_3, 11: 13753
stress and strain analysis of cylindrical, 11: 5296(J)
water conditions for high pressure, factors for maintaining, 11: 12010(J)

Boiling
analysis of high power density, equipment design for, 11: 9706
bubble dynamics and heat transfer in, conference on, 11: 7163
bubble formation, 11: 3792, 3793
bubble formation in boiling reactors, 11: 7755
bubble formation in H_2O, CH_3CH_2OH, CH_3OH, C_6H_6, and CCl_4, 11: 5763
bubble formation in superheated solutions, 11: 8284(R)
density distribution determination, 11: 9869(R)
density in vertical retangular multichannel sections with natural circulation, 11: 4413
detection in reactors, 11: 13717
equipment for testing water, 11: 10923(R)
film formation, effect of water temperature on heat flux, 11: 1848
heat transfer, density, and burnout tests, 11: 13864(R)
heat transfer and burnout testing, 11: 11745(R)
heat transfer by, 11: 5832(J), 11669
heat transfer characteristics of film, 11: 9052(R)
heat transfer for forced convection bulk, 11: 5297
heat transfer studies for Experimental Boiling Water Reactor, 11: 11747(R)
nucleate, detection in reactors, 11: 6444
nucleate, effects of pressure, heat flux, and flow rate on, 11: 1503
pressure drop during forced circulation, 11: 6707(J)
research studies, 11: 6705(R)
research on natural circulation, 11: 11748(R)
in short narrow channels, application to design of magnets cooled by liquid H_2 and N_2, 11: 6338(J)
theory for state of water-vapor mixtures in boiler tubes, 11: 11169(J)
theory of induced, of superheated liquid along track of ionizing particle, 11: 2215(J)

Boiling (cont'd)
transient pool, effect of sudden large heat generation, time required, 11: 1848
unstable film, with water inside tubes, 11: 10291(R)
vapor formation and behavior, 11: 6325
in water under transient conditions, 11: 7166

Boiling reactor experiments
(See also Experimental Boiling Water Reactor.)
Borax II water and steam cycles, 11: 13870(R)
coolant activity buildup and decay, 11: 11748(R)
design, 11: 11744(R)
fuel elements, 11: 10887(R)
fuel plates, fabrication and corrosion tests, 11: 11746(R)
operation of Borax-III, 11: 11748(R)
operational experience with Borax, 11: 1343(J)
radioactive carry-over, 11: 6921(J)
reactivity and inherent safety, 11: 11746(R)
reactivity changes from burnup and fission products, 11: 11748(R)
water decomposition in, 11: 11746(R)

Boiling reactors
(See also ARBOR Reactor; Argonne Low Power Reactor; Boiling reactor experiments; Experimental Boiling Water Reactor.)
bellows-type and diaphragm pumps for, design, 11: 2459
bibliography, 11: 11403
boiling water experiments, 11: 7755
control and reactivity, 11: 7785
criticality of highly-enriched, 11: 11799
criticality studies, 11: 7763
criticality studies for D_2O, 11: 13868(R)
criticality studies for Teapot, 11: 11755
delayed neutron losses in homogeneous, 11: 8609
design, calculations, characteristics, 11: 13866(R)
design, criticality studies, power recovery, and bubble formation, 11: 8707(R)
design and development, 11: 13982(R)
design and operation, 11: 681(J)
design and operation of power producing, 11: 4112(J)
design for power and Pu production, 11: 12534
design for producing superheated steam, 11: 9556(P)
design of, with adjustable reflector level, 11: 12263(J)
design of remote-region power reactor, 11: 10923(R)
design of slurry-fueled breeder, 11: 13906
design studies and kinetics, 11: 7857(R)
design studies of experimental, 11: 9781
design study for a 180-Mw nuclear power plant, 11: 12583
design study of heterogeneous, for a nuclear power plant, 11: 12583
design study of 10 Mw power package for use in remote locations, 11: 12531
development studies, 11: 7770
entrainment studies, 11: 7408(R)
excess reactivity for poison override, 11: 13868(R)
fuel cost estimates for closed cycle, 11: 4663, 11741
fuel element design, for D_2O-type, 11: 13868(R)

Boiling reactors (cont'd)

fuel element design, thermal analysis, core design and flowsheet for Experimental Breeder Reactor, 11: 10923(R)

heat removal, 11: 13868(R)

heat transients, 11: 13868(R)

hydrodynamic studies, 11: 8708(R)

kinetic behavior experiments, 11: 6088

linearized kinetics of Teapot, 11: 7768

maintenance, 11: 10280

multiplication factor, effects of bubble formation on, 11: 8543(R)

natural circulation system, 11: 3569(J)

neutron and γ fluxes in Experimental Breeder Reactor, 11: 10923(R)

oscillatory behavior of a two-phase natural circulation loop, theory, 11: 9279(J)

operating limits, relation of vapor separators to, 11: 13896

operational experience with Borax power plant, 11: 1343(J)

power conversion systems for dual cycle, 11: 13516(J)

power removal, 11: 11759, 12532

power transients in Borax-I, 11: 11744(R)

pressure drop and density change in calandria type, 11: 4077

radiation dosage from activity induced in core vessel, 11: 11756

radioactive carry-over, 11: 6921(J)

radioinduced heating in pressure shell, 11: 10923(R)

reactivity, 11: 7858(R), 12585(R)

reactivity effects of voids, criticality studies, and calculations of operating characteristics, 11: 13869(R)

relative stability of pressurized water moderated and, 11: 6913(J)

safety, 11: 5004, 6534

Spert-III reactors facility design, 11: 10285

stability, mathematical analysis, 11: 7769

steam voids, mathematical analysis, and reactivity calculations, 11: 11745(R)

steam-water separator development, 11: 4354

temperature coefficient of Experimental Breeder Reactor, effects of Pu^{239} production on, 11: 10923(R)

theory and design, 11: 13893

transfer functions, 11: 11423

Boise Basin (Idaho)

exploration, geology, mineralogy, and monazite occurrence, 11: 4865

Boko-Songo Valley (Belgian Congo)

geology, study of ore deposits and sediments of, 11: 1081

Bolts and nuts

rupture of remote connecting studs in Purex Process flanges, 11: 7161

stress analysis and failure, 11: 2545, 5010

thread testing, 11: 2443(R)

torquing of bolts for nuclear reactors, 11: 6084

Boltwoodite

a new uranium silicate mineral, 11: 1086(J)

Bonding

(See also Bonds; Brazing; Ceramic bonding; Diffusion; Slug canning; Slug coatings; Welding.)

glass to metal, fundamentals, 11: 13332

metal sleeves to cores, 11: 3231(P)

in metals, bibliography, 11: 13819

sonic inspection of Al to U, 11: 12448

theory, two-stage model for the solid-phase process, 11: 12662

Bonds

electrochemical fission of C–F, 11: 5800(J)

electron deficient, 11: 3742(J)

high-temperature tests of NaK, 11: 13969(R)

orders, methods of computing in toluidine, 11: 6003(J)

Bone diseases

radiotherapy with Ra^{224}, 11: 11893(J)

Bone fractures

radiation sickness effects on healing, 11: 6152(J)

Bone marrow

mast cell distribution in rat, effects on injected Au^{198}, 11: 7062(J)

preservation, 11: 9913(J)

protective effects of injected rat, in irradiated mice, 11: 4793(J), 5151(J), 9952(J), 11883(J)

transplantation in irradiated rats, 11: 11879(J)

radiosensitivity, 11: 41(J), 3290(J), 3291(J), 4225, 5168(J), 10025(J), 11029(J), 11844(J), 12960(R)

radiosensitivity effects of injected, 11: 35(J), 3657(J), 5720(J), 5739(J), 5745(J), 7074(J), 8795(J), 10413(J), 11045(J), 11880(J)

Bone Valley Formation (Fla.)

geology and exploration, 11: 2909(J)

Bones

analyses, 11: 7405(R)

analysis for Sr^{90} content, 11: 4257(J)

crystal structure as observed in the electron microscope, 11: 7910(R)

deposition of fission products in, effects of treatment with zirconium citrate and edathamil sodium, 11: 1755(J)

growth, radiation effects, 11: 6601(J)

influence of interposed, on radiation depth dose measurements, 11: 4938(J)

mineral metabolism in, 11: 893, 3679, 3680(J), 4290(J), 6190(J)

phosphorus metabolism, 11: 28(J), 4789(J)

phosphorus^{32} uptake in young mice, effect of cysteamine treatment, 11: 11907(J)

radiation dosage determinations for Sr^{90} and Sr^{90}–Y^{90} deposited in, young rabbits, 11: 2983(J)

radiation effects on, 11: 40(J), 43(J), 1392, 3311(J)

radioautograms of serial cross-sections of undecalcified, 11: 1411

radiometric analysis, 11: 12639(R)

radiostrontium content of samples collected in Canada in 1956, 11: 5172

rare earth content, 11: 1468(J)

spectrographic analysis, 11: 9576(R)

strontium and barium concentrations in human, 11: 12637(J)

strontium deposition, tracer study, 11: 12960(R)

strontium retention, effects of injected Ca and Sr in rats, tracer study, 11: 12961(R)

tumor mineral content, influence on x-radiation dosage, 11: 9970(J)

uranium content of beef, 11: 1434(J)

Boot Mesa Quadrangle (Ariz.-Utah)

geologic map, 11: 6724(J), 6725(J), 6726(J), 6727(J)

Boranes

See Boron hydrides.

Borates

(See also specific borates, e.g., Lithium borates; Potassium borates.)

thermodynamic properties of tetramethoxyborate ion, 11: 8819

Borax
(See also Sodium tetraborates.)
fusion, decomposition of oxide minerals by, 11: 4441(J)
Borazole
preparation, properties, molecular structure, 11: 4815(J)
Boric acid
chemical reaction with boron fluoride–methyl ether systems, formation of BOF, 11: 8301
crystal structure, 11: 8562(R)
effect on plants and germinating pollens, 11: 11047(J)
gravimetric determination in aqueous solution, 11: 3338
micro-analysis, 11: 111(J)
preparation from dimethyl ether–BF_3, 11: 9590(R)
reaction with pyridine bases, 11: 1922(R)
reactions with triethanolamine, 11: 4379
reactor control with, 11: 13189(R)
shielding properties compared to water, 11: 14033
solvent partition, 11: 11645
Boric acid–water systems
corrosive effects, 11: 8717(R), 11806(R)
corrosive effects and stability in reactors, 11: 9716
corrosive effects on fuel elements in pressurized water reactors, 11: 8718(R)
decomposition by pile radiation, 11: 13578(R)
radiation effects, 11: 9579(R), 9609
Boric acid–water-d_2 systems
decomposition by pile radiation, 11: 13578(R)
preparation and dosage determinations, 11: 1791(J)
radiation effects, 11: 7455(R), 9579(R), 9609
Boric acid systems
thermal stability, as chemical poison, and corrosive effects on structural materials, 11: 10987(R)
Borides
chemical and physical properties, 11: 1832(J)
electrical resistivity, Hall constant, and magnetic susceptibility of transition metal, 11: 3389(R)
infrared spectra of inorganic, 11: 12711(J)
physico-chemical properties of refractory transition element, 11: 11928(J)
Borine, chlorodimethoxy-
preparation with methyl borate and chloride compounds, 11: 5188
Borine, dimethoxy-
volumetric determination in methyl borate solutions, 11: 7943
Borines, alkyl-
oxidation mechanism, 11: 7930
reactions of methylborine with sulfur, 11: 3368(R)
Borines, phosphino-
polymerization by heat, 11: 3368(R)
Borohydride ions
free energy of formation, entropy and heat of solvation, 11: 3681
Borohydrides
(See also specific borohydrides, e.g., Aluminum borohydrides; Beryllium borohydrides.)
structure and chemical reactions, 11: 80
Boron
absorption cross sections of Harwell standard for neutrons of 2200 m/sec, 11: 9077(J)
atomic structure, 11: 3713(J)
burnout in reactors, 11: 11418
chemical and physical properties, 11: 1832(J)
colorimetric determination in atmosphere using turmeric paper test, 11: 11080
colorimetric determination in B compounds, 11: 5776
colorimetric determination in methanol, 11: 9229, 9998
colorimetric determination in organo-boron compounds, 11: 4285
colorimetric determination in U and in UO_2Cl_2 solutions, 11: 940(J)
colorimetric determination in U–Zr alloys, 11: 1774
colorimetric determination of trace amounts following electrochromatographic separation, 11: 11079
complexing agent for fluoride in recovery of U, and separation from U, 11: 7559
in cosmic radiation at $\lambda = 41.5°$, intensity of nuclei, 11: 3448(J)
deposition, methods of, 11: 13257
determination in boron fluoride–methyl ether systems, 11: 7434
determination in carbon and graphite, 11: 11586(R)
determination in rocks by neutron activation analysis, 11: 10448(J)
determination in soda salt, U peroxides, and slags, 11: 1772
determination in Th, 11: 12406(R)
determination in Zr by photometric methods, 11: 9590(R)
determination using anion exchange resins, 11: 6262(J)
from deuteron bombardment of B target, angular distribution, 11149(J)
deuteron reactions (d,n), study of neutrons from, 11: 11449(J)
diffusion into transition metals of IV, V, and VI groups on periodic system, 11: 1534, 11229(J)
dimensional stability and tensile properties, radiation effects on, 11: 13625
effectiveness as reactor control rod material, 11: 11745(R)
effects on thermal neutron captures in Fe, 11: 7891
electrochromatographic determination, 11: 4311(J)
electrolytic separation from fused salt, 11: 13596
electrophoretic deposition on duralumin plates, 11: 6416
electrostatic precipitation, 11: 12332(R)
evaporating techniques, 11: 3882(J), 3884(J)
gaseous species in equilibrium at high temperatures, 11: 10231(R)
Hall effect, apparatus for measuring, 11: 128
isotopic composition determination, 11: 9590(R)
isotopic exchange between BF_3 complexes and B-containing impurities, 11: 11561
isotopic exchange reactions between BF_3(gas) and BF_3-anisole(liq), 11: 11577(R)
metabolism in Chlorella, 11: 12642(R)
microscopic examination of cross sections of crystalline, 11: 8299
neutron absorption by, 11: 653, 3577, 4033, 9068, 9480, 10687(R), 11078

Boron (cont'd)
neutron cross sections, multigroup, 11: 12284
neutron total cross sections from 3.8 to 8.1 Mev, 11: 4046(J)
neutron transmission and scattering cross sections, 11: 11740(R)
preparation by BCl_3 reduction, 11: 7442
preparation from $(CH_3)_2OBF_3$, efficiency of, 11: 8399
production, 11: 7401, 7403(R), 7561, 8262, 8263, 9668, 10429
properties, 11: 11912
properties of Al–U fuel elements containing, 11: 7807
protons scattered at 96 Mev by, energy spectrum, 11: 612(J)
purification, 11: 5189(R), 6368(R)
radiation stability in reactors, 11: 11818
reactor criticality effects, 11: 9870, 13161, 13877
recovery from by-product of BF_3 complex decomposition, 11: 9532(P)
recrystallization processes, single crystal growth, 11: 128
separation from U, 11: 3235(P)
solvent partition in uranyl nitrate solutions, 11: 9688
spectra, 11: 2198(J), 5770(J)
spectrographic analysis for Fe, 11: 13599(R)
spectrographic determination in graphite, 11: 13280(J)
spectrographic determination in raw materials for graphite production, 11: 8298
spectrographic determination in U, 11: 10814(R)
spectrographic determinations in UO_2 and U_3O_8, 11: 10855
spectrophotometric and volumetric determinations in BF_3 solutions, 11: 11575
spectrophotometric determination, 11: 4307(J), 4820, 5211, 5777, 6253
spectrophotometric determination in high-temperature alloys by quinalizarin method, 11: 8848(J)
spectrophotometric determination in Pu, 11: 10839
vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)
volatilization from uranyl nitrate liquors, 11: 10828
volumetric determination in methanol-soluble alkyl hydroxy boranes, 11: 103

Boron–aluminum systems
See Aluminum–boron systems.

Boron–aluminum–uranium systems
See Aluminum–boron–uranium systems.

Boron carbide–aluminum systems
See Aluminum–boron carbide systems.

Boron carbide compacts
fabrication, 11: 13182

Boron carbide–copper systems (clad)
fabrication of panels, stainless steel clad, 11: 1513

Boron carbide–silicon carbide systems
physical properties of hot pressed, for gas-turbine application, 11: 1065

Boron carbide systems
corrosion by H_2O at 600°F, 11: 2483
powder metallurgy, 11: 13182

Boron carbide–titanium systems
cladding, corrosion, and mechanical properties, 11: 11673

Boron carbides
(See also Aluminum–boron carbide systems.)
corrosion by high-temperature water, 11: 11748(R)
dimensional stability and tensile properties, radiation effects on, 11: 13625
effectiveness as reactor control rod material, 11: 11745(R)
hot pressed, gas-turbine application, physical properties, 11: 1065
neutron removal cross sections, 11: 8570
radiation effects, 11: 8266(R), 9579(R)
solution rates in 215° and 260°C demineralized water, 11: 13870(R)
stability of irradiated, after 15 at. % burnup, 11: 14028

Boron chlorides
analysis, 11: 7433
equilibrium evaporation of, separation coefficients of B isotopes, in 11: 5424(J)
preparation from BF_3, 11: 7561, 9585
preparation from B_2O_3, 11: 6232
preparation of BCl_3 by reaction of methyl borate and Cl_2, 11: 5188
recovery using activated carbon, 11: 9586, 13021
reduction, 11: 8263

Boron–chromium–iron–nickel systems
corrosion, 11: 4664(R)
corrosion by water, 11: 11185
corrosion by H_2O at 600°F, 11: 2483
fabrication and mechanical properties, 11: 11748(R)
hardness, tensile properties, and impact tests, effects of radiation on, 11: 7361
preparation and properties, 11: 12751

Boron–chromium–nickel systems
as brazing alloy for high temperature alloys, 11: 10581(J)

Boron coatings
electrophoretic deposition of, for ionization chambers, 11: 3966(J)

Boron compacts
fabrication and corrosion, 11: 12245
sintering and corrosion, 11: 12244
sintering of Cu–B powder dispersions and corrosion, 11: 12753

Boron compounds
chemical properties, 11: 11058
chemical properties of Na triethylhydroborate and Na triisopropoxyhydroborate, 11: 3327
colorimetric determination using phosphomolybdic acid, 11: 5776
combustion analysis of organic, for B, 11: 4285
corrosive effects of water solutions on Pb and steel, 11: 13889
electric dipole and dielectric measurements of CH_3BF_2 and $(CH_3)_2BF$, 11: 955
molecular structure and chemistry of diammoniate of diborane, 11: 80
nuclear applications, 11: 4957(J)
nuclear quadrupole interactions, 11: 10017(J)
physical properties, 11: 3368(R)
preparation, purification, structure, vapor pressure, and density of $B_3N_3H_4$, 11: 88(J)
preparation and spectra of alkylboroxine, 11: 907
properties, 11: 11912
radiation stability in reactors, 11: 11818
Raman spectra of H_3BCO, 11: 1415(R)

Boron compounds (cont'd)
solid state reactions between, and various reactor matrix metals, 11: 13881
solubility in water, 11: 13889
spectrophotometric analysis for B, 11: 4820
synthesis of H_3NBH_3, $H_2B(NH_3)_2(BH_4)$, and $HB(NH_3)_3(BH_4)_2$, 11: 4381
toxicology, 11: 13889
volumetric analysis for boron, 11: 103
Boron–copper systems
preparation and properties, 11: 12752
Boron crystals
electrical properties of single, 11: 11281(J)
growth of single, 11: 128
Boron fluoride complexes
with anisole, vapor pressure, 11: 12319(R)
chemical determination of ether-containing, 11: 9533(P)
with dimethyl ether, conversion to BF_3, 11: 12335
with methyl ether, determination of SiF_4, Fe, Ni, Cu, and H_2O in, 11: 7443
with methyl ether, heat of compression, 11: 10814(R)
with methyl ether, preparation of pure B_2O_3 from, 11: 9536(P)
with methyl ether, thermal capacity, 11: 12340
with methyl ether, thermal decomposition of, effect of methyl fluoride on, 11: 12336
reaction of, with $AlCl_3$, 11: 9984
Boron fluoride–methanol systems
conversion to B, efficiency of, 11: 8399
reactions with CaF_2, 11: 7442
Boron fluoride–methyl borate systems
dissociation, 11: 7444
exchange reactions of B with B-containing impurities, 11: 11561
separation from methyl ether, 11: 13573
Boron fluoride–methyl ether systems
analysis for B and F, 11: 7434
chemical analysis, and separation of boron isotopes, 11: 7462
chemical reactions and formation of BOF, effect of boric acid, 11: 8301
conversion to KBF_4, 11: 11503(P)
corrosive effects, 11: 6368(R)
distillation, reaction with H_2O during, 11: 13109
distillation to separate B isotopes, 11: 13845
equilibrium constants and dissociation for B isotope separation, 11: 8556
exchange reactions of B with B-containing impurities, 11: 11561
sample preparation for mass spectrographic analysis for B^{10}, 11: 11734
specific conductivity, effect of variations in water content, 11: 12325
vapor pressures over wide temperature range, 11: 13573
Boron fluoride–water systems
specific conductivity, 11: 12325
Boron fluorides
acidity function in phosphoric acid solutions, 11: 10012(J)
analysis for B, Fe, and Cu, 11: 11575
boron exchange reactions, 11: 8557(R)
Boron fluorides (cont'd)
conversion of dimethyl ether–boron trifluoride complex to BF_3, 11: 12335
hydrolysis, 11: 11575
isotopic composition, mass spectroscopic analysis, 11: 152(J), 11313(J)
preparation by CaF_2 reaction with $BF_3 \cdot (Me)_2O$, 11: 7442
preparation by decomposition of aryldiazonium fluoborates, 11: 1421(J)
preparation of pure, 11: 11948(J)
production by distillation, 11: 7561
production of $B^{10}F_3$ for reactor safety elements, 11: 4096
properties of dihydrate, in H_2O complex, 11: 11594
recovery using activated carbon, 11: 13021
thermal expansion studies on BF_3, 11: 8692
vapor phase conversion of, to BCl_3 with $AlCl_3$, 11: 9585
viscosity, 11: 7561
Boron hydride–ethyl ether systems
equilibrium diagrams, 11: 906
Boron hydrides
(For substituted diboranes, see Diborane, Amino-, etc. See also Borohydrides.)
bonding and charge distribution in, 11: 3741(J)
chemical properties of derivatives, 11: 11058
chemical reactions with CO and NH_3, 11: 4381
colorimetric determination using phosphomolybdic acid, 11: 5776
crystal structure, 11: 8562(R)
electron deficiency in, 11: 3742(J)
equipment for monitoring atmospheres contaminated with, 11: 1187(J)
equivalent orbital bond moments, 11: 4331(J)
exchange of deuterium between diborane and pentaborane, 11: 6276
heat of vaporization of diborane, 11: 908
mass spectrum and vapor pressure of deuteriopentaborane, 11: 3699
molecular orbital calculation, 11: 4490(R)
nuclear magnetic resonance spectra, 11: 12943(J)
preparation, methods and chemistry of, 11: 8821(R)
preparation and purification of diborane, 11: 8543(R)
reactions of B_4H_{10} with NH_3, 11: 1415(R)
reactions with amines, 11: 3368(R)
reactions with Lewis bases, 11: 80
reactions with lithium halides and aluminum chloride, 11: 80
reactions with sodium amalgam and sodium hydride, 11: 6233
solvent properties for H_2, 11: 77
spectrophotometric analysis for B, 11: 4820
Boron isotopes
concentration determination by neutron-absorption analysis, 11: 11579
mass spectrometric analysis, 11: 6258(R), 10814(R)
production, 11: 6368(R)
radiometric analysis for B^{10}, 11: 10810(R)
relative abundance in nature, variations on, 11: 289(J)
separation, 11: 9664(R)
separation, effects of $BF_3 \cdot 2H_2O$ properties on, 11: 11594

Boron isotopes (cont'd)
separation and properties, 11: 11912
separation by chemical exchange, 11: 6301(J)
separation by distillation of dimethyl ether–boron trifluoride complex, 11: 13845
separation by fractionation of complexes containing, 11: 11534(P)
separation by fractionation of dimethyl ether–boron trifluoride complex, 11: 7462
separation by fractionation of polymer, 11: 7461
separation coefficients in equilibrium evaporation of BCl_3, 11: 5424(J)
Boron isotopes B^8
mass and half life from $Li^6(He^3,n)B^8$ reaction, 11: 1277(R)
Boron isotopes B^{10}
alpha reactions (α,d), energies of, 11: 2088(J)
alpha reactions (α,p), 11: 3101(J), 6113(J)
angular correlation in the 2.86-0.72-Mev cascade, 11: 1298(J)
applications, availability, and cost of B^{10}, 11: 6449(J)
branching ratios for slow neutron reactions (n,α), 11: 12269(J)
burnout in reactor control rods, method of calculating, 11: 12544
determination by neutron absorption, 11: 12347
determination in fluorides, 11: 152(J)
deuteron reactions (d,n), 11: 715(J), 1622(J), 2153(J), 2154(J), 5046(J)
deuteron reactions (d,p), angular distributions of protons from, 11: 6110(J)
energy levels, 11: 1680(J), 10628(J)
enrichment in distillation process for B^{10}, 11: 6453(J)
excited states, lifetimes, 11: 4052(J)
gamma energies from $Li^6(\alpha,\gamma)$ reactions, 11: 10231(R)
helium nucleus reaction mechanisms, 11: 2027(R), 2089(J), 6494(R)
lifetime of first excited state, 11: 3050(J)
mass spectrographic determination, 11: 11313(J), 11734
meson (π^+) production by 340-Mev protons by, 11: 5989(J)
nuclear energy level at 4.77 Mev, 11: 12866(J)
neutron reactions, 11: 1345(J), 1410, 2027(R), 5047(J)
proton reactions (p,$\alpha\gamma$), (p,γ), and (p,p'γ) at 0.7 to 3.0 Mev, γ spectra and yield curves, 11: 9496(J)
radiative transition widths in the lp shell, 11: 9456(J)
radiometric determination in B isotopes, 11: 10810(R)
separation, developments on industrial scale, 11: 12127(J)
separation and concentration by chemical exchanges, 11: 11577(R)
separation by thermal diffusion, 11: 7702
separation from B^{11} in dissociation of boron fluoride–methyl ether system, 11: 8556
separation using anisole, 11: 5189(R), 12513(R)
thickness of shield of, for Pu capture-to-fission ratio experiments, 11: 14035
tissue distribution in transplanted mouse brain tumor demonstrated by radioautogram, 11: 1410
x rays, proportional counter measurements of π-mesonic, 11: 12172(J)
Boron isotopes B^{11}
deuteron reactions (d,n), 11: 2154(J), 8194(J)
excited states, 11: 4645(J), 6494(R)
gamma emission, 11: 9054(R)
mass spectrometric determination in BF_3, 11: 11313(J)
meson (π^+) production by 340-Mev protons by, 11: 5989(J)
nuclear magnetic resonance in boron carbide and nuclear quadrupole coupling in ionic crystals, 11: 3596(R)
Boron isotopes B^{11} (cont'd)
nuclear quadrupole moment by use of analytic wave functions, 11: 13358(R)
quadrupole coupling constants for, in some boron compounds, 11: 10017(J)
radiative transition widths in the lp shell, 11: 9456(J)
separation from B^{10} in dissociation of boron fluoride–methyl ether system, 11: 8556
separation using anisole, 11: 5189(R)
x rays, proportional counter measurements of π-mesonic, 11: 12172(J)
Boron isotopes B^{12}
half life, 11: 6936(J)
isomeric states, 11: 11452(J)
Boron isotopes B^{13}
mass studied by reaction $Li^7(Li^7,p)B^{13}$, 11: 4125(J)
Boron nitrides
radiation effects, 11: 13578(R)
vaporization from 1660 to 2196°K, 11: 1859
vibration spectrum, 11: 10041(J)
Boron oxides
(See also Boric anhydride.)
analysis for water, 11: 3337
carbothermic reduction in a high-intensity arc flame, 11: 10429
chemical reaction with boron fluoride–methyl ether systems, 11: 8301
preparation from dimethyl ether–BF_3, 11: 9590(R)
preparation from $(CH_3)_2O$–BF_3 complex, 11: 9536(P)
structures and thermodynamic properties of high-temperature gaseous, 11: 5761
Boron polymers
construction, operation, and maintenance of fractionation unit for, 11: 7463
preparation and physical properties, 11: 3368(R)
Boron powders
pulverization using B_4C mortars and pestles, 11: 6234
Boron–silicon–zirconium systems
constitution diagrams, 11: 12738
Boron steel
chemical analysis, 11: 2678
fabrication and tensile properties of, for reactor shielding, 11: 11003
metallurgical properties and fabrication, 11: 2678
temper brittleness, effect of Ti and Zr on, 11: 6411(J)
transition temperatures, determination of, 11: 6411(J)
Boron systems
mechanical properties and corrosion of B-contained stainless steel, 11: 11747(R)
structures and thermodynamic properties of gaseous B_2O_3–H_2O, 11: 5761
Boron–tin–zirconium systems
corrosion in high purity water at 600 and 680°F, 11: 10880
Boron–titanium systems
cladding, corrosion, and mechanical properties, 11: 11673
corrosion, radiation effects, and microscopy, 11: 13079
corrosion by water at high temperatures, 11: 2483, 10880
welding, effects on ductility and hardness, 11: 11708

Boron–titanium systems (clad)

reactor control rods of, status of development, 11: 13079

Boron–zirconium systems

corrosion by water at high temperatures, 11: 2483, 10880

formation of boron solid solutions in, 11: 10104(J)

Boronic acids

preparation and properties of hydroxybenzeneboronic acids and anhydrides, 11: 9218(J)

Borosilicate glass

corrosion of Pyrex by liquid Na at 500°C, 11: 8679(R)

radiation effects, 11: 4163, 11474(J)

shielding properties of, effects on critical mass of aqueous solutions of U salts, 11: 14039

thermal insulation properties of pyrex, 11: 3384(J)

Bosons

(See also Elementary particles.)

Fermi coupling and mass and charge spectra, 11: 5682(J)

interactions with fermions, theory, 11: 5693(J), 5694(J)

multiple production of, theory, 11: 566(J)

weak interactions with leptons, 11: 3519(J)

Boulder Batholith (Mont.)

geology, mineralogy, and U deposits, 11: 2908(J)

mineralogy of Lone Eagle Mine in, 11: 5863(J)

secondary U minerals in W. Wilson Mine, geophysical study, 11: 4444(J)

Boundary layer

acoustic, near rigid walls, 11: 1502(J)

control with porous materials, 11: 7169

fluid flow in three-dimensional, theory, 11: 248(J)

laminar, compressed gas on plate in wide drop of temperatures, mathematical analysis, 11: 246(J)

measurement by radioactive tracer technique, 11: 1039

plastic flow in, mathematical analysis, 11: 243(J)

Brain

carbohydrate and mineral metabolism, effect on cerebral excitability, 11: 12(R)

function, tracer studies, 11: 17(J)

phosphorus uptake in normal, hypophysectomized and ACTH-treated hypohysectomized rats, tracer study, 11: 901(J)

radiation effects on cholinesterase levels in rats, 11: 1727(J)

radiation injuries of adult rat, exposed in utero, 11: 1742(J)

radioinduced cortical excitation in dogs, 11: 6151(J)

radioinduced functional and morphological alterations in, of rabbits, 11: 5718(J)

radiosensitivity of tissue cultures from monkey, 11: 7908

Brain tumors

radiodiagnosis, 11: 68(J), 4591(J)

Brannerites

occurrence, physical properties, optical properties, chemical composition, and x-ray powder diffraction pattern, 11: 1085(J)

Brass

(See also Copper alloys.)

corrosion by anisole–BF_3 system, 11: 6368(R)

heat transfer rates of tubes, 11: 11161

Brass (cont'd)

radiation effects, 11: 1922(R)

residual resistivity of, short-range order effect, 11: 369(J)

tensile properties of rolled green strip, 11: 9749

welding, application of ultrasonic energy to cold, 11: 11207

welding of cans for clad extrusions, 11: 7646(R)

Brass crystals

production in wire form, 11: 5876

Brass powders

rolling, 11: 9749

Brazed joints

corrosion by 680°F water of stainless steel, 11: 10081

ductility testing for, 11: 275(R), 4460(R)

method for forming, 11: 13733

shear properties at 1200°F, 11: 5338

testing, 11: 7196(R)

testing and evaluation, 11: 12020

Brazing

of beryllium tubes to high-temperature alloy collars, 11: 3837

equipment for high-temperature vacuum and hydrogen, 11: 5338

methods for, of heat exchangers, 11: 5873

of stainless steel, 11: 13564(R)

techniques for reactor instruments, 11: 8004

Brazing alloys

corrosion and oxidation resistance to Na at high temperature, 11: 7189(J)

corrosion and wear, data for water-cooled reactors, 11: 12028

corrosion by high-temperature water, 11: 10988(R)

corrosion by 680°F water, 11: 10081

oxidation, 11: 7196(R)

oxidation and liquid Na resistant, development, 11: 275(R), 4660(R)

properties of Ni-base, 11: 12608(R)

testing for brazing type 304 to type 304 stainless steel, 11: 13798

testing for use on Zircaloy-3, 11: 11198

Breath

radiometric analysis for radon content, 11: 8813(J), 9001(J)

radiometric analysis for respired $C^{14}O_2$, 11: 896

Breeder reactors

(See also specific breeder reactors, e.g., Argonne Power Breeder Reactor; Dounreay Fast Reactor; Experimental Breeder Reactor; Hanford Dual Purpose Reactor; KAPL Intermediate Power Breeder Reactor; KAPL Plutonium Power Breeder Reactor; Thorium Breeder Reactor; Uranium Production Reactor; ZEPHYR; Power breeder reactors.)

blanket fabrication and stability, 11: 4701(J)

chemical processing and fuel costs for power station using, 11: 8357(R)

conversion factors for, measurement, 11: 11348

conversion ratio as function of radius in, 11: 8593

conversion ratios of flattened and uniformly loaded cores, comparison, 11: 9852, 13975

core geometry effects on conversion ratio, 11: 8700

daughter product formation effects in, 11: 10971

description of fluid-fuel fluid-absorber for production of U^{233} and power, 11: 1338(J)

Breeder reactors (cont'd)

design, method of determining the number of production tubes in, 11: 8670

design and breeding, 11: 13965

design of D_2O heterogeneous, 11: 13960

design of Enrico Fermi, 11: 5608(J), 6103(J)

design of fast, 11: 12601

design of He cooled Pu, 11: 7739

design of homogeneous, 11: 11397

development and theory, 11: 8543(R)

economic and nuclear characteristics of cylindrical Th, 11: 7862

economics and operational variables of 1- and 2-region Th, 11: 3081(J)

fast, problems as power reactors, 11: 6102(J)

fission products and poisoning, 11: 2725

fission product separation by nuclear recoil in, feasibility, 11: 1341(J)

fuel cycles for single-region thermal, 11: 5604(J), 6096(J)

fuel exposures in heterogeneous thorium, calculations, 11: 9472

fuel solution processing, 11: 11609, 13641

fuel solution radioactivity, 11: 4079

neutron leakage by resonance capture in Th, 11: 2643

gain calculations for, 11: 8693

iodine removal system, 11: 12545

neutron economy of Th, uranium isotope formation effects on, 11: 7814

neutron leakage by resonance capture in Th, 11: 8597

neutron losses and optimum fuel processing period, 11: 2724

non-aqueous fluid fuel, nuclear data and design methods, 11: 11800

plutonium concentration in, control, 11: 7547

plutonium–uranium fuel cycles, 11: 6083

poisoning by fission and corrosion products, 11: 8601, 11760

power cost associated with use of N^{15} in, 11: 2111

ratio of Pu^{240} to Pu^{239} in natural U, effects of Np^{239} cross section and thermal flux on, 11: 6090

reactivity lifetime of U–Th bare slab, 11: 12227

regeneration factor of Th^{233}–U^{233} thermal, as a function of time, 11: 9787

resonance effects in one-region, thorium, 11: 3065

safety features of fast-, 11: 4110(J)

theory, 11: 13138

thoria pellets as blanket for, 11: 11761

thermal, principles of fuel and blanket processing, 11: 188(J)

two-group two-region approximation, 11: 8595

uranium isotope buildup in the core of a U^{233}, 11: 6097(J)

variation of breeding ratio with Th blanket concentration, 11: 8599

Bremsstrahlung

absorption of betatron, in two-layer absorber, 11: 3202(J)

circular polarization of β-ray produced, 11: 8127(J)

circular polarization of inner, 11: 10777(J), 10778(J)

classical model of K capture inner, 11: 4617(J)

in condensed media at high energies, multiple scattering effects, 11: 574(J)

Coulomb effects in inner, 11: 12939(J)

cross sections for, in neutron-proton collisions, 11: 4201(J)

detection in human body, 11: 9026(J)

Bremsstrahlung (cont'd)

instrument for sorting monochromatic photons from, 11: 3922(J)

longitudinal polarization at relativistic energies, 11: 10351(J)

measurements with Compton electron spectrometer, 11: 4579(J)

from neutral vector particles with anomalous magnetic moment, 11: 6871(J)

nuclear dissociation by 250- to 400-Mev, 11: 6115(J)

photon spectrum from, 11: 13353

polarization, from monocrystalline targets, 11: 10776(J)

polarization measurements from 1-Mev electrons on Al and Au, 11: 1557

proton, cross sections for γ ray production from, 11: 6021(J)

spectra corrected for multiple scattering in the target, 11: 6020(J)

spectrum of target, at small angles, 11: 8122(J)

theory of high-energy, in a screened field, 11: 6025(J)

Bridgeport Brass Co., Conn.

progress reports, 11: 7646(R)

British reactors

(See also BEPO; Calder Hall Reactors; DIDO; Gleep; Zephyr; LEO; LIDO; ZEPHYR; ZEUS.)

comparison of Berkeley, South Scotland, and Bradwell, 11: 6540(J)

coolant gas circuit and steam plant, 11: 10304(J)

cost of power produced by, 11: 9907(J)

design of Berkeley Power station reactors, 11: 5607(J)

design of Bradwell-on-sea nuclear power station, 11: 6541(J)

design of Merlin (medium-energy research), 11: 3563(J)

design and uses, ZEUS, 11: 2135(J)

general discussion of Harwell research, 11: 7333(J)

homogeneous aqueous, 11: 6542(J)

maintenance problems in Windscale, 11: 6915(J)

parameters and performance data of Calder Hall, 11: 2141(J)

power station designs for graphite moderated, 11: 3562(J)

reference list with characteristics, 11: 11441(J)

Brittle materials

mechanics, 11: 389(J)

Broad River Area (S. C.)

exploration, geology, mineralogy, and monazite reserves, 11: 4864

Bromates

chemical reactions of BrO_3^- with HSO_3^- and SO_2, 11: 6631

Bromides

(See also specific metallic bromides and classes of bromides, e.g., Uranyl bromides.)

determination by indirect flame photometric method, 11: 2835(J)

determination of, in fluoride volatility samples, 11: 13580(R)

Bromine

absorption spectra of, 11: 13580(R)

activation determination in petroleum, 11: 8296(R)

chemical effects of nuclear activation in propyl bromides, 11: 4338(J)

chemical reactions with hydrocarbons of neutron activated, 11: 10024(J)

determination in BrF_3, 11: 8387(R)

exchange reactions with bromate, 11: 11574(R)

gamma absorption cross sections, 11: 12287(J)

Bromine (cont'd)
neutron activation determination, 11: 12973(R)
neutron total cross sections, fast, 11: 2085(J)
proton reactions at 5.7 Bev, Li^8 emission from, 11: 5624(J)
reactions with hydrogen at elevated temperatures, kinetics, 11: 1424
spectrophotometric determination of, in BrF_3, 11: 13580(R)
vapor pressure, 11: 13577(R)
volume and activity of, produced in homogeneous reactors, 11: 13890
Bromine–bromine fluoride systems
distillation, 11: 8387(R)
electric conductivity, 11: 11073(J)
equilibrium constants for gas phase reactions, 11: 5229(J)
phase studies, 11: 13579(R)
Bromine compounds
synthesis of ethylenediamineplatinum(II) and (IV) bromides and iodides, 11: 10044(J)
Bromine fluoride–bromine systems
See Bromine–bromine fluoride systems.
Bromine fluoride–hydrofluoric acid systems
vapor pressure, 11: 13577(R)
Bromine fluoride–potassium fluoride systems
volatilization of UF_6 from, 11: 7407(R)
Bromine fluoride systems
electric conductivity, 11: 11073(J)
infrared spectra of liquid, at 75 to 80°C, 11: 9983(R)
Bromine fluoride–uranium fluoride systems
refractive index at 70°C, 11: 13579(R)
Bromine fluoride–uranium(VI) fluoride systems
corrosive effects on metals and alloys, 11: 7408(R)
phase studies of, 11: 13580(R)
separation of UF_6 from, 11: 10822
Bromine fluorides
absorption spectra of, 11: 13580(R)
chemical effects of 1-Mev electrons on, 11: 8321
chemical properties, 11: 9637, 9638
chemical reaction with U, 11: 12420, 13580(R), 13581(R)
corrosive effects, 11: 7709(R)
corrosive effects on Ni, Monel, K-Monel, and Inconel, 11: 13581(R)
dielectric properties, reaction mechanisms and solvent properties, 11: 11563(R)
distillation of $HF-BrF_5$ system at low temperature, 11: 9210
electrolysis of solutions, 11: 13577(R)
handling, 11: 9637
microwave spectrum and molecular structure, 11: 10022(J)
phase studies on BrF_3-BrF_5 system, 11: 13579(R), 13580(R)
physical properties of BrF_5, 11: 951(J)
preparation of UF_6 from UF_4 using, 11: 10849
radiation effects, 11: 8386(R), 8388(R)
reaction with F_2 to form BF_5, kinetics, 11: 9581(R)
reactions with metals and metal oxides, 11: 13576(R)
reactions with PuF_4, 11: 11564(R)
reactions with U, Pu, $Pu(IO_3)_4$, solvent properties for fluorides, and distillation, 11: 9578(R)
Bromine fluorides (cont'd)
solvent properties for U, 11: 3367(J)
spectrophotometric analysis of, for Br, 11: 13580(R)
volatilization, radiation effects, and chemical analysis for Br_2, 11: 8387(R)
Bromine fluorides (liquid)
solubility of Al, Zr, and U in, and kinetics of reaction with U, 11: 7407(R)
solvent properties for uranium, 11: 8265(R)
Bromine ions
collection chambers for, efficiency, 11: 7707
Bromine ions (recoil)
formation, 11: 12970(R)
Bromine isotopes
neutron capture, isotope effect, 11: 6875(J)
Bromine isotopes Br^{79}
Coulomb excitation, 11: 4054(J)
nuclear quadrupole resonance, 11: 2060(J), 3029(J), 9251(J)
Bromine isotopes Br^{80}
isomers produced in (γ,n) reaction, relative yields, 11: 5049(J)
Bromine isotopes Br^{81}
Coulomb excitation, 11: 4054(J)
gamma reactions (γ,n), relative yields of Br^{80} isomers produced in, 11: 5049(J)
neutron cross sections, 11: 8283(R)
nuclear quadrupole resonance spectrum, 11: 9251(J)
Bromine isotopes Br^{82}
decay schemes, 11: 9161, 10686(R)
gamma emission, 11: 1274(R), 6037(J)
half lives, 11: 8283(R)
recombination in aryl and alkyl bromides, 11: 9216(J)
Bromine isotopes Br^{88}
delayed neutron emission of fission product, 11: 6863(R), 12911(J)
Bromoform
hydrogen bond dissociation, 11: 1460(J)
Bromoörganic compounds
(See also specific compounds; e.g., Methane, Bromo-.)
chemical effects of nuclear activation in propyl bromides, 11: 4338(J)
non-homogeneous reactions following neutron capture, 11: 6247(J)
Bronze
(See also Copper–tin alloys; Slug coatings (bronze); Zirconium bronze.)
corrosion and wear, data for water-cooled reactors, 11: 12028
cryogenic data, 11: 386
emissivity and reflectivity, measurement of total normal, 11: 6421
liquid flow rates in porous, and corrosion, 11: 1038
Brookhaven National Lab., Upton, N. Y.
meteorology, 11: 7730(R)
nuclear facilities and buildings, 11: 2711
progress reports, 11: 12(R), 4487(R), 7045(R), 7691(R), 7709(R), 7734(R), 9789(R), 11838(R), 13883(R), 13884(R), 13885(R)
progress reports on fission product utilization, 11: 1372(R), 13043(R)

Brookhaven National Lab., Upton, N. Y. (cont'd)

progress reports on reactor engineering, 11: 2633(R), 7710(R), 7730(R), 7731(R), 7732(R), 7733(R), 7738(R), 8445, 8446, 9789(R), 9983(R), 10277(R), 10278(R), 10925(R), 11752(R), 13119(R), 13120(R), 13121(R), 13122(R), 13123(R), 13124(R), 13125(R), 13126(R), 13127(R), 13886(R)

progress reports on waste processing development project, 11: 11147(R)

radiological monitoring, 11: 11838(R)

Brookhaven Reactor

breeder blanket (ThF_4) studies, 11: 7731(R)

component testing, 11: 13883(R)

control rod development, 11: 7731(R)

cooling system engineering development, 11: 13882

criticality studies, 11: 7733(R)

design, 11: 112(J), 591(J), 2633(R), 2634, 2678, 2711, 2712, 2715, 2717, 7730(R)

design and criticality studies, 11: 13965

design and development report, 11: 7731(R)

design and operation, 11: 12525

enriched fuel element loading, hazards report, 11: 9092

experimental and theoretical study of subcritical, 11: 10924

exponential measurements, 11: 7734(R)

fuel element fabrication, 11: 2635

fuel element testing, 11: 7731(R)

graphite annealing operation for, 11: 7735

graphite for, evaluation, 11: 8579

moderator annealing, 11: 9604

moderator testing procedures, review, 11: 6888

neutron flux distribution, 11: 10686(R)

operation, 11: 10277(R), 10278(R), 13122(R), 13123(R)

operation and control, 11: 12(R), 2634, 2635, 2712, 2713, 5575

operation at higher flux levels, analysis, 11: 13885(R)

reactivity effects of experimental absorbers in, 11: 12224

reactivity studies, 11: 7731(R)

reactor kinetics, dependence on temperature, 11: 13883(R)

shielding design, 11: 2712, 2714, 2761

subcritical experiments, 11: 7732(R)

temperature distribution and thermal stresses in the structures of, 11: 8577

temperature, theoretical analysis, 11: 7731(R)

Brookhaven Shielding Facility

fission source calibration at, method of, 11: 11822

Brookhaven Synchrotron

operation, 11: 12(R), 3185(J), 4487(R)

proton beam, 11: 3185(J)

Brown Univ., Providence

progress reports on radiation damage in solids, 11: 3596(R)

Browns Park Formation (Wyo.)

geophysical exploration and geology, 11: 4433

Brush Beryllium Co., Cleveland

progress reports on Be fabrication, 11: 2494(R), 2495(R), 2496(R), 7631(R), 8525(R), 9729(R), 9730(R), 11691(R), 11692(R)

progress reports on Be production, 11: 2290(R), 2517(R), 2518(R), 2520(R), 2521(R), 2522(R), 13095(R)

Brushy Basin Member (N. Mex.)

geology, 11: 2910(J)

BSR

See Bulk Shielding Facility.

Bubble chambers

conference on, 11: 13395(J)

control by counters, 11: 3003(J)

design data, 11: 386, 3970(J), 4948(J), 6493

design of continuously sensitive, 11: 13392(J)

designing for safety in hydrogen, 11: 10193(J)

ionizing capacity of particles in, 11: 3003(J), 9010(J)

meson scattering at low energies studied by H, 11: 3003(J)

operating characteristics of gas-liquid, 11: 3003(J), 12813(J)

optical system to simplify analysis of photographs of, 11: 1565

propane, description and tests, 11: 9400

propane, mesons(μ) decay and absorption in, 11: 12824(J)

research program at Univ. of Michigan, 11: 3003(J)

research with, survey, 11: 4615(R), 6868(R)

stereoscopy in, 11: 10187(J)

theory and operation, 11: 753(J), 2215(J), 6505(J)

Bubbles

behavior of, in liquids flowing through "U" tubes, 11: 13709

density along the path of ionizing particles crossing a bubble chamber, 11: 9010(J)

detection in boiling reactors, 11: 10923(R)

diffusion of air into a pulsating cavitation, 11: 6417

effect of gravity and change of shape on underwater explosion, 11: 6418

formation, flow sheet for, 11: 3783(R)

formation at high power densities, equipment design for studying, 11: 9706

formation in boiling, conference on, 11: 7163

formation in homogeneous reactor fuels, 11: 13982(R)

formation in internally heated aqueous solutions, 11: 9756

formation in Intermediate Scale Homogeneous Reactor, 11: 8592

formation in pumps, 11: 12451

formation in H_2O, CH_3CH_2OH, CH_3OH, C_6H_6, and CCl_4, 11: 5763

formation in supersaturated water flowing in pipes, 11: 8543(R)

formation kinetics, 11: 6705(R)

gas-, size measurement in liquids, 11: 446(J), 461(J)

growth rates in boiling, 11: 3793

speed of rise in liquids, 11: 6424

theory of bubble motion in a rotating liquid, 11: 13181

thermodynamics, 11: 3792

Buckhorn claims (Calif.–Nev.)

geology, mineralogy, uranium occurrence, 11: 3402

Buckman deposits (Colo.)
geology, 11: 1118(J)
Buckskin Gulch Quadrangle (Ariz.-Utah)
photogeotogic map of, 11: 12043(J)
Buckskin Gulch Quadrangle (Utah)
photogeologic map, 11: 9319(J)
Buffalo Creek Area (S. C.)
exploration, 11: 4864
Building materials
aircraft, creep under constant loads and temperatures, 11: 6375
aircraft, effects of thermal radiation, 11: 325
aircraft, emissivity and reflectivity, measurement of total normal, 11: 6421
aircraft, mechanical properties, 11: 1051
aircraft, radiographic inspection, 11: 10521(R)
corrosion in chemical control solutions, 11: 11686
corrosive effect of reactor coolants on, effect of O content, 11: 2487
elastic constants of Ti, 11: 1135
fatigue crack detection, 11: 1053
high temperature properties, 11: 325, 326, 3851(R), 6367
mechanical shock resistance of elastic-plastic steel beams, 11: 2549
radiation effects, 11: 13516(J)
welding aircraft steels, 11: 8010(R)
Bulk Shielding Facility
bibliographies, 11: 12587
control problems, 11: 14031(R)
coolant circulation, 11: 1618(R)
critical experiments, 11: 1618(R)
evaluation for use in Homogeneous Reactor Experiment chemical processing development, 11: 8622
fuel element corrosion studies, 11: 13178
gamma heating in, 11: 5614(J)
instrumentation, saturation properties and linearity response, 11: 1618(R)
neutron flux distribution, 11: 11764, 14034
neutron leakage, 11: 11754, 11764
power determination, 11: 13133
radiation from, 11: 1618(R)
reactivity, 11: 5591
thermal neutron flux measurements, 11: 1618(R), 7758
Bullion Monarch Mine (Utah)
uranium occurrence, 11: 10539
Bureau of Mines. Div. of Explosives Technology, Pittsburgh.
progress reports on combustion and explosion hazards of H_2-H_2O-air mixtures, 11: 74(R), 75(R)
progress reports on Zr hazards research, 11: 11913(R)
Bureau of Mines. Northwest Electrodevelopment Lab., Albany, Oreg.
progress reports on zirconium, 11: 10888(R), 10899(R), 13059(R), 13060(R), 13061(R), 13062(R), 13063(R), 13064(R), 13066(R), 13067(R), 13068(R), 13069(R), 13070(R), 13071(R), 13072(R), 13073(R), 13074(R) 13075(R)
Burns
hemoglobinemia following, in swine, 11: 11017
production on pig skin, 11: 10397
Burns (cont'd)
production on pig skin, effectiveness of protective ointments, 11: 9948
production on pig skin, effectiveness of textiles as shielding, 11: 9949
production on pig skin, exposure scale, 11: 5137
production on pig skin, factors affecting, 11: 6598
production on skins treated with protective cream, 11: 835
Burros
life span, effects of chronic γ irradiation, 11: 6607(J)
Busfield Claims (Wyo.)
geology, mineralogy, exploration, and localization of U ore, 11: 4862
1,3-Butadiene
copolymerization with perfluoropropylpropenyl ketone, 11: 2844(R)
Butadiene polymers
effects of radiation and hot, pressurized H_2O, 11: 1804
with fluoroörganic compounds, preparation, 11: 2844(R)
radiation effects, 11: 965(J), 5246, 6674
with styrene, vacuum forming, 11: 4850
Butane
mass spectra, metastable transitions in, 11: 4559(J)
radiolysis, radical production in, 11: 10463(J)
Butex Process
absorptiometric analysis of solutions for U, 11: 4281
acidity measurements on process streams by electrical conductivity, 11: 3691
infrared determination of hydroxylic impurities, 11: 11119
Butyl phosphate–carbon tetrachloride systems
solvent properties of, for UO_2Cl_2, 11: 13580(R)
Butyl phosphate complexes
with uranium, analysis for tributyl phosphate, 11: 931
Butyl phosphate–heptane–nitric acid systems
density, 11: 11626
Butyl phosphate–hexane systems
analysis for tributyl phosphate, 11: 931
Butyl phosphate–hydrochloric acid systems
solvent properties for Th, Zr, and Sc, 11: 1000(J)
Butyl phosphate–kerosene–methanol–water systems
constitution diagrams, 11: 12405(R)
Butyl phosphate–kerosene–nitric acid systems
solvent properties for U and Th, 11: 10811(R)
Butyl phosphate–kerosene–nitric acid–thorium nitrate systems
phase studies, 11: 7143, 12957, 12967
Butyl phosphate–kerosene systems
analysis for tributyl phosphate, 11: 931, 3748
density, effect of temperature, and concentrations of TBP, U, and HNO, 11: 2398
fluorophotometric analysis for MBP and DBP, 11: 7436
radiation effects, 11: 3744(J), 7130(R)
radiation effects, detection by ultraviolet spectra, 11: 13628
separation of TBP by complex formation, 11: 3748
solubility in HNO_3, 11: 10812(R)

Butyl phosphate–kerosene systems (cont'd)

solvent extraction of Th with, 11: 12359

solvent properties for $Pu(NO_3)_4$, 11: 4384

solvent properties for U and $UO_2(NO_3)_2$, 11: 212

solvent properties for U in ore solutions, 11: 11570

Butyl phosphate–kerosene–thorium nitrate–water systems

phase studies, 11: 12967

Butyl phosphate–kerosene–uranium nitrate systems

phase studies, 11: 12971(R)

solubility of Ca and Pb sulfates and silicic acids in, and solvent partition of Gd, Mo, and Pm in, 11: 10808

Butyl phosphate–methanol–water systems

constitution diagrams, 11: 12405(R)

Butyl phosphate–nitric acid systems

distribution of uranyl nitrate in, 11: 2331

explosion in Purex TNX evaporator, 11: 8364

phase studies, 11: 11626

solvent properties for Th, Zr, and Sc, 11: 1000(J)

Butyl phosphate–nitric acid–thorium nitrate systems

phase studies, 11: 12359

Butyl phosphate–nitric acid–uranyl nitrate systems

density and viscosity, 11: 12339

Butyl phosphate–phosphoric acid systems

exchange reactions, 11: 9587(R)

Butyl phosphate systems

phase studies employing P^{32}-labeled tri-n-butyl phosphate, 11: 10487

Butyl phosphate–thorium nitrate–water systems

phase studies, 11: 10812(R)

polymerization reactions of $Th(NO_3)_4$ and TBP, 11: 8357(R)

Butyl phosphates

(See also those specific separation processes in which TBP is used as an extracting agent.)

analysis, 11: 12970(R)

chemical and physical properties of TBP, 11: 13592

chemical properties, 11: 7560

chemical properties and diluents, 11: 8371

corrosive effects on laboratory materials, 11: 7560

degradation products of TBP, 11: 12316, 13667

determination by acid saturation method, 11: 9594

determination by decomposition and colorimetry of P, 11: 12971(R)

determination in aqueous solutions of $Th(NO_3)_4$ and HNO_3, 11: 8289(R)

determination in kerosene by dielectric constant method, 11: 2826

determination in organic solvents by dielectric method, 11: 12339(R)

determination in $Th(NO_3)_4$ solutions, 11: 10812(R)

determination of DBP in process solutions, 11: 12316

Butyl phosphates (cont'd)

determination of TBP in hexane and kerosene diluents, 11: 931

extraction efficiency, 11: 8340(R)

extraction of Th, Pa, and U with, in the Thorex Process, 11: 11606(R)

extraction process, design for use in Thorex Process for U^{233} purification, 11: 8345

fluorophotometric determination of DBP and MBP in TBP–kerosene systems, 11: 7436

hydrolysis products, determination in organic solvents, 11: 7436

hydrolysis of TBP and effect on Purex Process efficiency, 11: 9661

path in HNO_3 recovery in TBP Process, 11: 8369

physical properties, 11: 2339

physical properties of TBP-diluent solutions, 11: 7427

preparation of P^{32}-labeled tri-n-butyl phosphate, 11: 10487

pyrolysis of TBP, 11: 11576(R)

radiation effects, 11: 13982(R)

radiation effects on solvent properties, 11: 13639(R)

radiolysis, 11: 5243(J), 5245, 8286(R), 11576(R)

reaction of fission product I_2 with, 11: 4357

reclamation, method of, 11: 7560

recovery of TBP from Zr-separation process, 11: 7532

separation, identification, and purification, 11: 6291

separation from kerosene, 11: 3748, 12405(R)

solubility and hydrolysis in aqueous solutions, 11: 11574(R)

solubility in HNO_3, 11: 11626

solubility in aqueous solutions, 11: 7426, 8368(R)

solubility in HNO_3 and solvent properties for Th, Y, and Eu, 11: 10812(R)

solubility in various organic solvents and aqueous salt solutions, tracer study employing P^{32}-labeled tri-n-butyl phosphate, 11: 10487

solvent extraction and solvent properties, 11: 12405(R)

solvent extraction chemistry of TBP, 11: 11602

solvent extraction equilibria for rare-earth nitrates, 11: 11111

solvent properties, 11: 9645(R)

solvent properties, theory, 11: 8286(R)

solvent properties for Ce, Y, Zr, Nb, and Ru, 11: 7969

solvent properties for inorganic nitrates, 11: 6303(J)

solvent properties for monovalent electrolytes, 11: 11576(R)

solvent properties for $Pu(NO_3)_4$, 11: 4384

solvent properties for separation of Hf and Zr, 11: 7428(R)

solvent properties for Th, 11: 10813(R)

solvent properties for Th and $Th(NO_3)_4$, 11: 748(R), 12339(R)

solvent properties for U, 11: 2856(R), 7555, 7560, 8393, 12344, 13003

solvent properties for Zr and Hf, 11: 3747

solvent properties in Thorex Process solutions, 11: 8357(R)

spectrographic analysis for rare earths, 11: 10810(R)

stability of, with HNO_3, 11: 7560

uranium recovery from, 11: 7560

C

Cables
radiation effects, 11: 4160, 4161, 13629
variations in the distance between different points, effect of radioactive marking, 11: 1250(J)

Cadmium
corrosion by water, 11: 13597(R)
Coulomb excitation by N ions, γ rays from, 11: 4067(J)
deposition and polarographic investigation, 11: 1435(J)
determination in black oxides, 11: 1772
diffusion in AgCd, 11: 11194(R)
effectiveness as reactor control rod material, 11: 11745(R)
electrodeposition on ultra-high-strength steels, embrittlement reduction, 11: 5888
heat capacity between 20° and 270°C, 11: 4462(R)
ion exchange behavior on Dowex-50, 11: 5276(J)
isotope shifts and hyperfine structure in atomic spectrum, 11: 1653(J)
K fluorescence yield, 11: 5545(J)
melting temperature at pressures up to 30,000 kg/cm^2, 11: 1533, 3856(J)
neutron absorption by, 11: 653, 9480
neutron cross sections, 11: 10229, 12284
neutron elastic scattering cross sections, 11: 2174(J)
neutron inelastic scattering from, spectrum, 11: 10910
neutron reactions (n,γ), 11: 13209
neutron transmission measurements from 14.5 ev to 11 kev, 11: 4642(J)
neutron total cross sections, 11: 1276(R), 2026(R), 4130(J)
nuclear magnetic resonance experiment, 11: 9056(J)
polarographic determination in Pu-bearing solutions, 11: 12346
polarographic determination of, on stainless steel tubing surfaces, 11: 9230
proton scattering cross sections, 11: 1542(R)
reactor criticality effects, 11: 13161
reduction in HCl solution, 11: 9982
separation of carrier-free In from, by adsorption and solvent extraction, 11: 12710(J)
solubility in CdI_2, 11: 9217(J)
spectra, effect of argon pressure on red line of Cd^{114}, 11: 6971(J)
toxicity, 11: 13253

Cadmium (liquid)
control of gas-cooled power reactor by insertion of, 11: 7729

Cadmium alloys
preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

Cadmium–aluminum–copper alloys
See Aluminum–cadmium–copper alloys.

Cadmium–bismuth–indium alloys
See Bismuth–cadmium–indium alloys.

Cadmium chlorides
chronopotentiometric determination in LiCl–KCl systems at 450°C, 11: 2834(J)
dissolution in fused KCl, polarographic behavior, 11: 1435(J)

Cadmium coatings
electrophoretic deposition of CdO, on mold steel, 11: 4880(R)
heat and corrosion-resistant, testing for steel, 11: 3385(R)

Cadmium complexes
with cyanide, electrometric and polarographic studies, 11: 4828(J)
with nitrosonaphthol, formation constants, 11: 4301(J)

Cadmium compounds
solid state reactions between, and various reactor matrix metals, 11: 13881

Cadmium cyanides
complex salts, electrometric and polarographic studies, 11: 4828(J)

Cadmium–gold alloys
electric conductivity, effects of quenching on, 11: 5354(J)
lattice defects, quenching in, 11: 1922(R), 5354(J)

Cadmium–indium–silver alloys
dynamic irradiation program for, as control rod material, 11: 11957
preparation and properties, 11: 12751, 12752

Cadmium iodide crystals
thermodynamic properties, 11: 9587(R)

Cadmium ions
electrochemical properties, 11: 11911
reduction, measurement of transfer coefficients for, 11: 11911

Cadmium isotopes
abundance, upper limits, 11: 472(J)
neutron reactions (n,p), relative cross sections, 11: 5561(J), 10250(J)

Cadmium isotopes Cd^{109}
energy levels studied by radioactivity of In^{109}, 11: 3524

Cadmium isotopes Cd^{110}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)
spin assignment of excited levels, 11: 13448(J)

Cadmium isotopes Cd^{111}
electric hexadecapole moment of the first excited nucleus, 11: 12864(J)
neutron resonances, 11: 4642(J)

Cadmium isotopes Cd^{112}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

Cadmium isotopes Cd^{113}
neutron reactions, 11: 3089(J), 4642(J)

Cadmium isotopes Cd^{114}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

Cadmium isotopes Cd^{116}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

Cadmium–magnesium alloys
corrosion resistance, 11: 1080(J)
energy of activation for disordering in, calorimetric determination of, 11: 3423(R)
thermal capacity, 11: 10575(J)
thermodynamic properties, 11: 10574(J)

Cadmium selenides
absorption spectra and excitor emission, 11: 1195(J)

Cadmium–silver alloys
corrosion by water, 11: 12753
self-diffusion, 11: 11194(R)

Cadmium sulfates
solubility, 11: 12584(R)
solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)

Cadmium sulfide crystals

growth of high-sensitivity, for gamma-ray detectors, 11: 7276(J)

photoconductivity, extinction, 11: 1192(J)

photoresistance to x radiation, performance as radiation dosimeters, 11: 8098(J)

preparation and properties, 11: 486(R), 1201(R), 4570(R)

Cadmium sulfides

cells for detection of x- and γ rays, 11: 509(J)

photoresistance to γ and β radiation, 11: 1746(J)

pulse heights, effects of visible light sub-illumination on, 11: 6479(J)

Cadmium zinc sulfides

phosphorescence of, de-excitation by electric fields, 11: 1179(R)

photoconductivity, effect of d-c fields on, 11: 4488

Cages

See Metabolism cages.

Calcium

analysis using flame photometer, 11: 12405(R)

bone deposition, tracer study, 11: 3679, 3680(J), 5179(R), 6190(J), 9576(R), 12639(R), 13566(R)

determination in NaCl solutions, 11: 7678(R)

electron energy losses in, and its compounds, 11: 745(J)

flame photometric determination, 11: 12973(R)

ion exchange behavior on Dowex-50, 11: 5276(J)

ion exchange with Na on Dowex-50 resin, 11: 7136

isotopic equilibration determination, 11: 7113(J)

metabolism, effects on Sr uptake, double tracer study in rats and rabbits, 11: 8816(J)

metabolism, tracer studies using Ca^{45}, 11: 4808(J), 5134(R), 7398(R), 7929(J), 9916(R), 9979(J), 11021(R), 11049(J), 11803(R), 12639(R)

metabolism in plants and animals, effects on Sr uptake, 11: 11888(J)

microvolumetric determination in V, 11: 2269

neutron capture cross sections, 11: 12888(R)

neutron reactions, 11: 2022(J), 3585(J), 3592

production by Al reduction of CaO, 11: 12322(R)

purification by distillation, 11: 13602

purification of, by removal of Mg by sublimation, 11: 8512(R)

reaction between water vapor and, kinetics in temperature range 20 to 70°C, 11: 7938(J)

reaction with water vapor, kinetics of, 11: 8820

reduction of BeO with, 11: 1158(J)

separation from Mg, 11: 7677(R)

separation procedures, tracer study, 11: 7113(J)

solvent extraction from $Ca(NO_3)_2-ZrO(NO_3)_2-HNO_3$ solutions with TBP, 11: 3747

solvent partition between hexone and $HNO_3-Ca(NO_3)_2$ solutions, 11: 6685(J)

spectrographic determination in pitchblendes and U–Mg slurries, 11: 12971(R)

spectrophotometric determination in TBP process streams, 11: 11584

spectrophotometric determination in U, 11: 932

volumetric determination in water, 11: 9227, 9228

x-ray diffraction analysis and electrical resistivity of allotropes of, 11: 7676(R)

Calcium alloys

structure of binary intermetallic compounds, bibliography, 11: 4879

Calcium borides

effectiveness as reactor control rod material, 11: 11745(R)

Calcium compounds

formation and high-temperature properties of $CaO \cdot 3BeO$ and $2CaO \cdot 3BeO$, 11: 4428(J)

Calcium crystals

physical properties, 11: 8512(R)

Calcium fluoride–calcium oxide systems

phase studies, 11: 7673(R)

Calcium fluoride crystals

color centers, investigation of, 11: 13578(R)

luminescence spectra activated by rare earths, 11: 787(J)

Calcium fluorides

adsorption of rare earth fission products, 11: 8382(R), 11662

adsorptive properties, 11: 13641

coloration and luminescence, 11: 5376(J)

corrosion by fluorine gas at high temperatures, 11: 7184

infrared transmission, 11: 2197

physical properties, effect of radiation on, 11: 6567(J)

precipitation from aqueous solutions, 11: 3350(J)

preparation and properties of Mn-activated, 11: 4614(R), 8030(J)

reaction kinetics with H_2SO_4, 11: 10812(R)

scintillation properties, 11: 12339(R)

solubility in HNO_3, 11: 12359

sorptive properties for U and fission products, 11: 7837(R), 11635(R)

thermal conductivity, 11: 2552, 12728(J)

Calcium hydroxide slurries

applications in Thorex solvent processing, 11: 7486, 8397, 12990

Calcium hydroxides

absorption of waste hydrogen fluoride by, 11: 8431

neutron-diffraction analysis, 11: 5932(J), 8286(R), 11576(R)

Calcium ions

self-diffusion in polysterenesulfonated solutions, 11: 9587(R)

Calcium isotopes

angular momentum coupling and internucleon interaction in, 11: 3045(J)

isotopic analysis with aluminum ion emitter, 11: 126(J)

neutron reactions (n,p), relative cross sections, 11: 5561(J)

thermal neutron reactions (n,γ), 11: 710(J)

Calcium isotopes Ca^{39}

beta decay, 11: 7292(R)

half lives, 11: 10686(R)

Calcium isotopes Ca^{40}

decay schemes, 11: 4717, 6064(J)

deuteron reactions (d,p), 11: 1542(R), 10231(R)

energy levels from $K^{39}(p,\gamma)$ reaction, 11: 9143(J)

gamma reactions (γ,pn), cross sections for, 11: 13518(J)

Calcium isotopes Ca^{42}

deuteron reactions (d,p), 11: 5553(J), 10763(J)

Calcium isotopes Ca^{43}

energy levels, 11: 626(J), 5553(J)

energy levels from proton angular distributions from $Ca^{42}(d,p)Ca^{43}$ reactions, 11: 10763(J)

Calcium isotopes Ca^{44}

deuteron reactions (d,p)Ca^{45}, proton angular distributions, 11: 10764(J)

Calcium isotopes Ca^{45}

bone deposition, 11: 893, 7291(R), 7695(R), 10803(R)

energy levels from proton angular distributions from Ca^{44}(d,p)Ca^{45} reactions, 11: 10764(J)

formation in neutron-irradiated foodstuffs, 11: 5733

radiometric determination in the presence of Sr^{90}-Y^{90}, 11: 7398(R)

Calcium isotopes Ca^{47}

decay properties, 11: 551, 1698(J)

Calcium isotopes Ca^{48}

decay properties, 11: 3601(J)

electric monopole pairs from 3.82 Mev state, search for, 11: 10232(R)

Calcium isotopes Ca^{49}

decay properties, 11: 11576(R)

Calcium–nickel alloys

preparation and properties, 11: 13083(R)

Calcium nitrates

vapor pressure, 11: 7861(R)

vapor pressure of aqueous solutions, 11: 12320

Calcium oxalates

analytical uses in separation and decontamination of Th and rare earths from U, Al, Be, and Zr, 11: 13297(J)

Calcium oxide–aluminum oxide–silicon oxide systems (liquid)

See Aluminum oxide–calcium oxide–silicon oxide systems (liquid).

Calcium oxide–beryllium oxide systems

See Beryllium oxide–calcium oxide systems.

Calcium oxide–calcium fluoride systems

See Calcium fluoride–calcium oxide systems.

Calcium oxides

ignition at 1500 to 3000°C, 11: 12971(R)

preparation of high purity, by ignition of CaC_2O_4, 11: 10430

spectrographic analysis for impurities, 11: 12352(R), 12971(R)

temperature effects, 11: 10811(R)

Calcium phosphates

for decontamination of radioactive solutions by precipitation, 11: 3227(P)

Calcium–polonium alloys

preparation and crystal structure, 11: 3413

Calcium sulfates

precipitation from UO_2SO_4 solutions, 11: 8383(R)

solubility in Mallinckrodt Process raffinate solutions, 11: 8281

solubility in TBP–kerosene–U nitrate systems, 11: 10808

solubility in uranyl sulfate solutions, 11: 13641

Calcium sulfides

meson capture by different elements in, 11: 5984(J)

Calcium titanates

breakdown voltage, 11: 261(J)

Calcium–uranium alloys

microstructure of, containing small amounts of Ca, 11: 7654(R)

Calculators

(See Computers.)

Calder Hall Reactors

comparison with the Shippingport Pressurized Water Reactor, 11: 6068 9131(J)

construction site organization and planning, 11: 6539(J)

design, 11: 658(J), 665(J), 681(J), 1334(J), 2141(J), 6068

metallurgical problems in construction, 11: 9118(J)

operation, 11: 3084(J)

power plant including turbines steam cycle, water preparation and cooling towers, 11: 1336(J)

slug rupture detection system, 11: 5037(J)

California (Inyo Co.)

uranium occurrence in Green Velvet Claims in, 11: 7191

California (Lassen Co.)

geology and mineralogy of Buckhorn claims in, 11: 3402

California (San Bernardino Co.)

geological exploration, 11: 3829(J)

California Inst. of Tech., Pasadena. Jet Propulsion Lab.

progress reports on corrosion and ignition of Ti alloys, 11: 273(R), 274(R), 1075(R)

progress reports on stability of TiB_2 and ZrB_2 in air, O_2, and N_2, 11: 5857(R)

California Research and Development Co. Livermore Research Lab. Livermore, Calif.

progress reports on Materials Testing Accelerator development, 11: 7869(R), 7876(R), 9880(R), 10996(R), 12619(R), 13838(R), 14020(R)

progress reports on reactor design evaluation, 11: 9873(R)

California Research Corp., Richmond, Calif.

progress reports on effects of radiation on aircraft lubricants and fuels, 11: 12693(R)

California. Univ., Berkeley. Minerals Research Lab.

progress reports on wettability of Pt by sodium silicate glass, 11: 1543(R)

California. Univ., Berkeley. Radiation Lab.

progress reports, 11: 8549(R), 8568(R), 12341(R)

progress reports on Bevatron operation and development, 11: 1357(R), 3180, 4724(R)

progress reports on chemistry, 11: 2254(R), 3330(R), 4814(R), 7091(R), 9591(R)

progress reports on Materials Testing Accelerator development, 11: 4136(R), 8735(R), 9886(R), 9887(R), 13197(R)

progress reports on medical and health physics research, 11: 4227(R), 5136(R), 9916(R)

progress reports on physics, 11: 1923(R), 4615(R), 6868(R), 10233(R)

report list on Crocker 60-in. cyclotron, 11: 12280

California. Univ., Los Angeles. Atomic Energy Project

progress reports, 11: 8259(R), 9576(R), 10803(R), 10812(R), 13566(R)

progress reports on development of colorimetric dosimeters, 11: 12517(R)

progress reports on medical research, 11: 1725(R), 2233(R), 2237(R), 7398(R), 7695(R), 8258(R), 12959(R), 12960(R), 12961(R), 13565(R)

California. Univ., San Francisco. School of Medicine. Radiological Lab.

progress reports, 11: 21(R), 6596(R)

Californium

ion-exchange separation from Am and Cm by elution with α-hydroxy isobutyric acid, 11: 1004(J)

Californium isotopes

nuclear properties, 11: 13443

Californium isotopes Cf^{252}

fission fragment velocities, 11: 9054(R)

fission products, 11: 10229

spontaneous fission, 11: 1671(J), 2027(R), 6047(J), 13444

Californium isotopes Cf^{254}

half life, spontaneous-fission, 11: 13460(J)

spontaneous fission energy release, calculated, 11: 13444

synthesis in cosmos, 11: 9376(J)

Caloosahatchee Marl (Fla.)

occurrence in De Soto Co., 11: 2909(J)

Calorimeters

applications in dosimetry of x-ray beam, 11: 2990(J), 4587(J)

design, 11: 8747(R), 14020(R)

design for determination of ion beam intensities, 11: 9407(J)

design for measuring adiabatic specific heat, 11: 314

design for measuring nuclear radiations, 11: 8282(R), 12140(J), 12330(R)

design for measuring thermodynamic properties of liquids, 11: 6792(J)

design of flow, 11: 12340

design of furnace, for obtaining specific heats of solids at high temperatures, 11: 1176

design of precision combustion, construction, operation, and chemical and electrical calibration, 11: 3468

performance for measuring energy required to produce an ion pair in air for Co^{60} gamma rays, 11: 2941(J)

shield control, automatic adiabatic, 11: 10150(J)

Calorimetry

activity measurements for the naturally radioactive elements, 11: 9002(J)

Calutrons

(See also Electromagnetic separation plant.)

acceleration potential regulator circuit, 11: 5103(P)

collector units, recovery of U from, 11: 9538(P)

decelerating ion receivers for, operating experience, 11: 9763

design, 11: 11530(P)

graphite arc blocks for ion generation, 11: 8253(P)

ion output and efficiency, 11: 9764

liner cooling in Hg isotope separation, 11: 2582

operation, production, development, 11: 3935(R)

precision selector for voltage regulator tubes, 11: 8553

source units and liners, spray washing for U recovery and reuse, 11: 2583

uranium recovery from stainless steel parts, 11: 5090(P)

uranium recovery from wash solutions, 11: 11505(P)

Cameras

(See also Photography; X-ray cameras.)

design of, using nuclear emulsions, 11: 7278(J)

high-speed, design of pulse generating circuit for exciting Kerr cell used as shutters, 11: 7034(P)

luminescence, design and operation, 11: 6446(J)

moving plate, for use with nuclear emulsions, 11: 2147(J)

Cameras (cont'd)

slit for high speed, effect of diffraction pattern, 11: 2576

spark shadowgraph, design, 11: 2233(R)

Cameron Area (Ariz.)

exploration, geology, mineralogy, and U deposits, 11: 10083

Camp Creek Placer Area (Idaho)

exploration, geology, and mineralogy, 11: 3824

Canada

uranium production in, 11: 10085(J)

Canada. Dept. of Mines and Technical Surveys. Mines Branch

progress reports on solvent extraction of U solutions, 11: 3758(R)

Canadian reactors

See NPD Reactor; NRX Reactor; NRU Reactor; ZEEP.

Cancer

See Tumors.

Capacitors

applications of rotating, as counter and function generator, 11: 8071

bank changes, 11: 10329

charging and transistors, equations for circuit analysis, 11: 8972

development of ceramic high-energy storage, 11: 11242(R), 11243(R)

radiation effects, 11: 8215

reliability, 11: 3911

sampling plans, 11: 6436

testing TiO_2 and TiO_2 systems for use as, 11: 3387(R)

Capillaries

failure of gas addition, in in-pile loops, 11: 9736

Capture cross sections

See Electron capture cross sections; Neutron capture cross sections; Proton capture cross sections.

Capture-to-fission ratios

binding energy effects, 11: 8267(R)

measurement, 11: 13857

shield thickness of B^{10} for Pu experiment, 11: 14035

Carbide and Carbon Chemicals Corp. Y-12 Plant, Oak Ridge, Tenn.

accident report on neutron source rupture, 11: 13571(R)

progress reports on analytical chemistry, 11: 12352(R), 12410(R)

progress reports on carnotite studies, 11: 2359(R)

progress reports on health physics, 11: 11559(R), 13571(R)

progress reports on UF_6 preparation, 11: 13706(R)

SF materials accounting and quality control, 11: 215, 12342

Carbide crucibles

corrosion by liquid U, 11: 7677(R)

Carbide crystals

size measurements in annealed Cr steel at elevated temperatures, 11: 345(J)

Carbides

(See also Rare earth carbides.)

electrical conductivity and bonding, 11: 6636(J)

formation, device for studying mechanism and kinetics, 11: 6238(J)

infrared spectra of inorganic, 11: 12711(J)

physico-chemical properties of, in heat-treated steel, 11: 13348(J)

physico-chemical properties of refractory transition element, 11: 11928(J)

Carbides (cont'd)
solubility in U, 11: 13788(R)
thermodynamic properties, 11: 6713
wear properties for seal application, 11: 6321
Carbohydrates
(See also Sugars.)
metabolism during radiation sickness, 11: 3658(J)
Carbon
(See also Carbon black; Diamonds; Graphite.)
adsorptive properties for U recovery, 11: 6683
angular distribution of 424-Mev protons elastically scattered from, 11: 10350(J)
antiproton cross sections, 11: 10710(J)
combustion determination in Fe, 11: 2258
combustion determination in metals and alloys, 11: 3700
cross sections, 11: 13197(R)
determination in Th, 11: 12406(R)
determination in U, by induction heating, 11: 9589(R)
determination in U by taking up CO_2 in $Ba(OH)_2$ and titrating, 11: 12971(R)
determination in U metal, 11: 11564(R)
deuteron inelastic scattering cross sections at 190 Mev, 11: 8735(R)
deuteron stripping in, polarization of protons from, 11: 703(J)
diffusion in $\alpha-Fe$, 11: 3427(R)
diffusion into transition metals of IV, V, and VI groups on periodic system, 11: 1534, 11229(J)
disintegration after π^--meson capture, 11: 4133(J)
elastic and inelastic scattering of polarized protons by, 11: 12286(J)
electric resistivity of thin films, 11: 4632(R)
electrochemical fission of C–F bond in halocarbons, 11: 5800(J)
electron energy losses in, 11: 745(J), 4152(J)
exchange reactions of C^{14} between CNI and $C^{14}N^-$, 11: 3685(J)
gamma reactions, 11: 697(J), 700(J), 4115, 5655(J)
interactions with low-energy negative pions, 11: 12826(J)
isotopic standards for, 11: 10159(J)
mass transfer between dissimilar metals in contact with molten Na, 11: 8479
meson production by proton bombardment, 11: 4601(J), 5989(J)
meson production in, by cosmic rays, 11: 1939(J)
metabolism in normal and diabetic rats, tracer study, 11: 1406
neutron, proton, deuteron, He^3, and α scattering cross sections, 11: 10996(R)
neutron cross sections, multigroup, 11: 12284
neutron production from cosmic-ray interactions in, 11: 687(J)
neutron reactions, 11: 1277(R), 1618(R), 2174(J), 3035(J), 3577, 4046(J), 4736(J)
neutron scattering, 11: 6856, 10229
neutron total cross sections, 11: 11739(R)
neutron yields from deuteron and neutron reactions, 11: 8726
nucleon momentum in, from high-energy photoeffect, 11: 3021(J)
oxidation with forced O_2 of tubes, 11: 6634(J)
paramagnetic resonance, radiation effects on, 11: 1920(R)
penetration of fission spectrum neutrons, 11: 1268
Carbon (cont'd)
photoprotons from bremsstrahlung irradiated, 11: 12908(J)
plant metabolism, tracer studies, 11: 12661
polarization of 970-Mev protons scattered from, 11: 5065(J)
polarization of nucleons scattered by, 11: 6956(J)
preparation and properties of high-temperature pyrolytic, 11: 160
proton reactions, 11: 612(J), 4993(J), 4994(J), 5555(J), 6493, 6497, 6562
protons scattered by, calculation of polarization of Bev, 11: 8213(J)
purification, 11: 153(R), 1795(R)
radiation chemistry, mechanisms of, 11: 11953(J)
solubility in γ-uranium, 11: 7630(R)
solubility in Th at room temperature and elevated temperatures, 11: 11703(R)
thermodynamic properties of C_2, 11: 11218
x-ray incoherent scattering functions, 11: 2164(J)
Carbon (activated)
(See also Charcoal.)
adsorption of BCl_3, 11: 9586
adsorptive properties for organic compounds, 11: 210(J)
adsorptive properties for recovery of BCl_3 and BF_3 gases, 11: 13021
Carbon black
heat radiation and emissivity measurements, 11: 3797
Carbon compounds
magnetic moments of $C^{12}O^{16}$, and $C^{13}O^{16}$, 11: 1383(R)
paramagnetic resonance in, 11: 12069
synthesis of labeled, 11: 10043
Carbon dioxide–hydrogen–oxygen systems
radiation effects, 11: 9587(R)
Carbon dioxide–nitrogen systems
radiation effects on gas composition, 11: 8313
Carbon dioxides
alpha-ray induced luminescence, 11: 8971(J)
analysis for CO, 11: 7948
chemical analysis for moisture using Karl Fischer reagent, 11: 7111
chemical analysis for residual gases after absorption with KOH, 11: 7947
electron drift velocity in, 11: 4916(J)
equivalent orbital bond moments, 11: 4331(J)
infrared absorption analysis for trace amounts of oils, 11: 5216
mass spectrographic analysis, correction factors for, 11: 10159(J)
molecular breakup following C^{14} decay, 11: 9189(R)
physical properties, 11: 12970(R)
properties as a reactor coolant, 11: 5839
radiolysis, 11: 9247(J)
reactions with chromel–alumel thermocouples at 1000°C, 11: 4541
sampling prior to determination of oil, 11: 8840
sampling under pressure, 11: 7946
sampling with small heated cylinder, 11: 6255
solubility in biphenyl, isopropyl- at atmospheric pressure and temperatures to 125°C, 11: 5406
Carbon films
electrical properties of arc-evaporated, 11: 7217(J)

Carbon films (cont'd)
electron scattering by, at 20 kev, 11: 440(J)
Carbon ions
correlation effects in the ground state, 11: 1707(J)
linear energy transfer in tissue, 11: 4245(J)
thermodynamic properties, calculation of ideal-gas, 11: 12788
Carbon–iron systems
self-diffusion of Fe in molten, 11: 1171(J), 3424(R)
Carbon–iron–titanium systems
radioautographic analysis, 11: 3850(R)
Carbon isotopes
abundance, upper limits, 11: 8983(J)
age measurements and techniques, 11: 15(J)
chemical effects in oxidation of CO by NO_2, 11: 7096(J)
isotope shift and mass ratios, 11: 1383(R)
nuclear properties, 11: 11562(R)
separation of C^{12} and C^{13} by ion exchange, 11: 4810(R)
Carbon isotopes C^{11}
energy levels studied by $B^{10}(d,n)$ reaction, 11: 1622(J), 5046(J), 11449(J)
K capture and K/β^+ ratio of, 11: 12936(J)
spins and parities of levels in, 11: 2154(J)
Carbon isotopes C^{12}
alpha-particle scattering at 31.5 Mev, 11: 746(J)
alpha reactions (α,p), ground state angular distribution, 11: 9186(R)
decay schemes, 11: 11452(J)
deuteron reactions, 11: 2082(J), 2088(J), 2144(J), 4715(J), 4716, 7339(J)
electron scattering, 11: 613(J), 6560(J)
energy levels, 11: 6558(J), 9054(R), 9080(J)
excited state at 4.43 Mev, lifetime, 11: 6866(R)
formation and excited states of, from deuteron irradiation of B, 11: 11449(J)
formation by α capture in core of stars, 11: 3889(J)
gamma ray and electric monopole pair transitions, 11: 10232(R)
gamma rays from reaction $C^{12}(p,\gamma)N^{13}$, investigation, 11: 708(J)
gamma reactions, 11: 5043(J), 6125(J)
gamma reactions (γ,n), cross sections, 11: 11450(J)
ground state energies for α-particle and shell models, 11: 580(J)
helium nucleus reactions, 11: 2027(R), 5625(J)
inelastic electron scattering, 11: 1305(J)
mass measurement in mass spectrograph, 11: 619(J)
neutron absorption cross section, errors in measuring, 11: 7714
neutron resonance at 2.07 Mev, 11: 4016(R)
neutron scattering cross sections, 11: 9189(R)
nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)
nitrogen nucleus reactions, interpretation, 11: 5627(J)
nuclear pairs emitted during monopolar o–o transition, 11: 10253(J)
photodisintegration, 11: 6936(J)
photon self-absorption and scattering by 15.1-Mev level, 11: 9504(J)
photoneutron threshold, 11: 1600(J), 4039(J)
potassium iodide crystal light output under bombardment by, dependence on energy, 11: 7355(J)
production of monopole pairs, 11: 10686(R)
Carbon isotopes C^{12} (cont'd)
proton reactions, 11: 609(J), 1301(J), 1542(R), 2176(J), 4145(J), 4147(J), 5540(J), 11377(J)
radiative transition widths in the 1p shell, 11: 9456(J)
reaction with K^+ mesons to produce 3 α particles, 11: 2150(J), 2151(J)
scattering of 187-Mev electrons by, and nuclear density distribution, 11: 2165(J)
scattering of polarized neutrons by, 11: 1682(J)
spins and parities of levels in, 11: 2154(J)
Carbon isotopes C^{13}
alpha reactions (α,n), 11: 3097(J), 6117, 13519(J)
angular distribution, parity, and nuclear spin, 11: 10249(J)
chemical effects in isomerization of cyclopropane, 11: 7095(J)
chemical shielding and spin coupling of, 11: 6004(J)
chemical shifts and indirect spin-spin couplings of compounds containing, 11: 4037(J)
energy levels, 11: 4635(J), 9189(R), 9511(J)
first excited states, calculation, 11: 4975
gamma reactions (γ,p), cross sections, 11: 1352(J)
helium nucleus reactions, 11: 1277(R), 2027(R), 2089(J), 6118(J), 6119(J) 6865(R), 11375(J)
isotope effects in photolysis of C_2H_5Br, 11: 5806(J)
isotope effects on urea decomposition, kinetics, 11: 4339(J)
photodisintegration, 11: 6936(J)
photon reactions, 11: 1618(R)
production, laboratory method, 11: 10157(J)
proton reactions, 11: 599(J), 2086(J), 3582(J), 4016(R), 4124(J), 6063(J), 11377(J)
Carbon isotopes C^{14}
alpha reactions (α,n), 11: 3091(J)
analysis and disintegration, 11: 8283(R)
atmospheric concentration, 11: 13250(J)
beta decay, 11: 4632(R)
determination in compounds doubly labeled with H^3 and C^{14}, 11: 9008(J)
deuteron reactions, 11: 2088(J), 6112(J)
distribution in nature, 11: 8940(J)
geological and archeological dating with, 11: 771(J), 6361(J)
measurement methods for tracer quantities, 11: 10797(J)
preparation from Be_3N_2 irradiation, 11: 12330(R)
production from graphite in reactors, 11: 8308
proton reactions (p,n), 11: 3091(J)
radiation dosage determinations from labeled morphine injected in man, 11: 10423
radiometric determination, 11: 896, 1778(J), 3330(R), 3701, 3962(J), 4814(R), 5499(J), 7091(R), 12330(R)
radiometric determination by liquid scintillation counting, 11: 9022(J), 10647
radiometric determination in archeological specimens, 11: 11995(J), 11996(J)
separation from irradiated beryllium nitride, 11: 12339(R)
synthesis of compounds labeled with, 11: 10043
tracer techniques for studies of photosynthesis, 11: 12661
Carbon isotopes C^{15}
mass studied by reaction $Be^9(Li^7,p)C^{15}$, 11: 4125(J)
nuclear properties, 11: 1228(J)
production by $C^{14}(d,p)$ reaction, 11: 1228(J)

Carbon–lanthanum system
crystal structure, 11: 4810(R)
Carbon monoxides
determination in CO_2, 11: 7948
effect on stainless steel corrosion, 11: 8286(R)
magnetic moment, measurement by millimeter wave spectroscopy, 11: 1383(R)
oxidation by NO_2, carbon isotope effect, 11: 7096(J)
reaction rate with O_2, 11: 9248(J)
reaction with U at 1200°C, 11: 7660(R)
reactions with boron hydrides, 11: 4381
rotational transition frequencies and magnetic moments, 11: 4489(R)
Carbon steel
cleaning pipes and tubing of, for nuclear coolant systems, 11: 13337
corrosion, 11: 8717(R), 9863(R), 11682(R)
corrosion, effect of thermal shock, temperature rise, heat treatment, and rising pH on, 11: 6722(J)
corrosion, inhibition by pertechnetate, 11: 8286(R), 11676
corrosion, radiation effects on, 11: 11187
corrosion by biphenyl, 11: 5310
corrosion by caustic solution, 11: 10877
corrosion by decontaminating solutions, 11: 8708(R)
corrosion by hot water, 11: 269, 337, 2482, 4267, 4614(R), 6722(J), 8715(R), 12898(R)
corrosion by liquid Bi-base metals, 11: 8444
corrosion by water, 11: 2900, 7328(R), 8911, 11806(R)
corrosion by water at reactor conditions, 11: 6721
corrosion of chromium coated samples, 11: 10879
corrosion of SAE 1010 by liquid Na, 11: 7727
embrittlement by H_2 of cold-worked, 11: 1532(J)
fracture behavior of welded plate, 11: 2510
hardness and tensile properties, radiation effects on, 11: 4166
heat transfer curves for slabs, 11: 10863
neutron irradiation effects, 11: 4739
neutron streaming, 11: 7691(R)
radioactivity induced in pipes from Submarine Thermal Reactor coolant, 11: 11226
reactor irradiation effects and stress corrosion, 11: 337
secondary hardening of, alloyed with V, Mo, and Ti at annealing temperatures of 300 to 700°, 11: 1157(J)
tensile properties, 11: 6092
tensile properties of irradiated, 11: 10292
testing for naval reactor pressure vessels, 11: 12605
thimble, mechanical properties for pressure vessel service at 600 to 650°F, 11: 4884
welded to stainless steel, failure, 11: 13091
welding of stainless-clad, from unclad surface, 11: 4896(J)
wettability with pure Ag and various Ag-brazing alloys, 11: 377(J)
x-ray investigation of deformation and bond strength in crystal lattice, 11: 5328(J)
Carbon steel (stainless steel clad)
welding, 11: 7859(R)
Carbon–tantalum systems
phase studies and thermodynamic properties, 11: 5767
Carbon tetrachloride
bubble growths in superheated, 11: 5763
effects on incorporation of phosphorus into liver desoxyribose nucleic acid, and on mitotic activity of liver cells, 11: 20
infrared determination of hydroxylic impurities, 11: 11119
radiation effects, 11: 12521(R)
radiation-induced exchange of Cl_2 with, 11: 12688(J)
thermal conductivity from 2 to 82°C, 11: 1855(J)
Carbon tetrachloride–acetic acid–water systems
See Acetic acid–carbon tetrachloride–water systems.
Carbon tetrachloride–butyl phosphate systems
See Butyl phosphate–carbon tetrachloride systems.
Carbon–thorium systems
electrical resistivity, 11: 7676(R)
hardness and structure, 11: 8492(R)
melting point, 11: 11704(R)
phase studies, 11: 7673(R), 7677(R), 8512(R)
Carbon–titanium systems
phase studies, 11: 4468
Carbon–uranium sandstone deposits
exploration for, in U. S. and Alaska, 11: 10084(R)
Carbon–uranium systems
carbon content vs. temperature, 11: 3428
dimensional change characteristics, 11: 12426(R)
microstructure of, containing 0.706 to 76% U, 11: 7654(R)
phase studies, 11: 7626(R), 7694(R), 10887(R), 11688(R)
phase studies and microstructure, 11: 7626(R)
radiation effects, 11: 13824
Carbon–zirconium oxide systems
equilibrium at elevated temperatures, investigation of, 11: 1516(J)
preparation of compacts, 11: 7984
Carbon–zirconium systems
preparation and chemical and physical properties, 11: 11182(J)
Carbonaceous rocks
occurrence of U hearing, in U. S. and Alaska, 11: 10084(R)
Carbonaceous shale deposits (U.S.)
bibliography of the geology of U-bearing, 11: 11189
Carbonaceous shales
(See also Bituminous shales; Black shales; Oil shales.)
chemical properties of organic matter of, 11: 9986(R)
Carbonates
(See also carbonates of specific elements and Uranyl carbonates.)
analysis for, in mill liquor and consumption during leaching, 11: 2405
coloration and luminescence, 11: 5376(J)
spectrophotometric analysis for U, 11: 2832
thermoluminescence, 11: 7220(J)
volumetric determination, 11: 2826
Carbonic acid, butyl ester
radiolysis products, 11: 8286(R)
Carbonyl compounds
formation in aqueous pepsin solutions, 11: 11920

Carcinomas

growth of transplanted, effects of preirradiation of tumor bed, 11: 860(J)

radioinduced, review, 11: 1392

radioinduced in personnel handling radium, 11: 2786(J)

of thyroid, therapy with I^{124}, 11: 7079(J)

Carlisle Quadrangle (Utah)

photogeologic map, 11: 1097(J)

Carnegie Inst. of Tech., Pittsburgh

progress reports on phase studies in Ti–Cr alloys, 11: 4467(R)

Carnegie Inst. of Tech., Pittsburgh. Metals Research Lab.

progress reports on electrochemical studies of non-aqueous melts, 11: 3424(R), 3441(R)

Carnotite deposits (Nev.)

occurrence in Panaca Area, 11: 3403

Carnotite ores

uranium recovery by salt-roast carbonate leach process, ratio of V to U as a factor in, 11: 10857

Carnotites

processing for U recovery, 11: 2302(R), 2309(R), 2310(R), 2317(R), 2360, 2390, 7538(R), 11647(R)

processing for U and V recovery, 11: 2323, 2359, 2363(R), 4842(R) 9613, 11508(P)

Carotene

absorption spectra of crystal suspensions, 11: 2872(J)

preparation of labeled, using C^{14}-ion beam, 11: 4814(R)

Carrier Vessel Reactor

control rod misalignment study, 11: 13990

coolant radioactivity from leaks, and radioactivity vs. crud particle size, 11: 10291(R)

hydrodynamic testing, 11: 12897(R)

hydrodynamic testing and safety measures for major rupture and core meltdown, 11: 10291(R)

pressure vessel closure, photoelastic analysis of, 11: 12869

reactor constants for lattices, 11: 7709(R)

safety in core meltdown, leaks, ruptures, and crud radioactivity, 11: 12897(R)

Cascade impactors

(See also Particles.)

performance, 11: 7223

performance in removing Pu from air, 11: 892, 5714

Cascade showers

(See also showers identified by the inducing radiation, e.g., Cosmic showers.)

angular and radial distribution functions of electron-photon, 11: 4621(J)

angular and spatial distribution functions of particles in, 11: 9356(J)

fluctuation problem in, solutions, 11: 3517(J), 9063(J)

high-energy nuclear active particle, theory, 11: 9355(J)

multiple processes in electron-photon, 11: 10131(J)

number of electrons produced in single electron initiated, 11: 9369(J)

observation in nuclear emulsions, 11: 2171(J), 5507(J), 5919(J)

production by electrons and photons in light and heavy elements, 11: 4627(J)

Cascades

design of thermal diffusion, 11: 8555

paralleling, effects of circular flow, stages, and flow rates on, 11: 2886

problem of, in a water distillation plant for heavy water production, 11: 141(J)

Case Inst. of Tech., Cleveland

progress reports on scaling of Zr, 11: 1873(R), 3393(R), 5874(R), 10528(R)

Cast iron

corrosion by liquid Na, 11: 7847(R)

corrosion by water, 11: 13597(R)

machining, effects of annealing and B additions, 11: 7658(R)

Casting

bibliography on equipment for pressure die, 11: 3415

centrifugal, of reactor fuel slugs, equipment and methods, 11: 7723

control of gas production in light metal, 11: 3430(J)

vacuum apparatus for U, 11: 7017(P)

Castings

non-destructive inspection, 11: 7172(J)

radiographs of defects in, standard comparison, 11: 1062

Castle Mountains (Mont.)

geology and geophysical exploration in Meagher, Cascade, Judith Basin, and Wheatland Cos., 11: 4435

Castle Operation

fall-out from, pathological effects on human beings, 11: 834

fall-out monitoring by gamma measurements, 11: 10650

fall-out monitoring in Pacific Ocean, 11: 878

medical survey of Marshallese exposed to fall-out during, 11: 832

Catalases

liver and kidney, effects on radiosensitivity of rats, 11: 54(J)

radioinduced inactivation, 11: 1729(J), 1730(J)

radiosensitivity in mouse livers, 11: 12642(R)

Catalysis

surface, review, 11: 4375(J)

Catalysts

(See also specific catalysts Enzymes; Platinum catalysts.)

gamma radiation effects on, 11: 4337(J)

properties of rare earth, 11: 4353(J)

radiation effects on solid, 11: 11963(J)

for recombination of radiolytic gases over ThO_2 slurries, 11: 4265

Cataracts

radioinduced, protection afforded by injected embryonic cell material in mice, 11: 8798(J)

radioinduced, relationship to dose, 11: 6599(J)

radioinduced in laboratory animals, 11: 871(J), 4229(J), 5139(J)

Catawba River Area (N. C.)

geophysical exploration, 11: 3404

Catheters

indwelling intravenous polyethylene assembly for rabbits, 11: 12959(R)

Cathodes

arc-, for operation in magnetic fields, 11: 2744

current anomalies in mercury, interferometric analysis, 11: 13381(J)

Cathodes (cont'd)
development of alkali photo-, 11: 1245(R)
electron emissions, 11: 3456(J)
Cation exchange materials
exchange reactions, 11: 12970(R)
Cations
in metal complexes, soft x-ray absorption, 11: 737(J)
Caustic leach solutions
See Uranium leach solutions (caustic).
Cave Hills Area (S. Dak.)
lignite mines and prospects in, 11: 1082, 4434
Caves
decontamination of, used in manufacture of Ba^{140}, 11: 7454
design, 11: 2633(R), 13969(R)
design, safety and criticality studies for, 11: 13835
design for multicurie chemical process research, 11: 3354
modular, for storing radioactive metal particles, 11: 1702(J)
remote and direct maintenance, comparison for chemical processing plants, 11: 3735
ventilation considerations, 11: 2294, 11041(J)
Cavity resonators
coupling of, non-resonant, 11: 3439
coupling of resonance cavities by, 11: 4532
design and characteristics of, 11: 3586, 5944
design for microwave spectrometers, 11: 8025(R)
measurement of inductive reactance vs. effective resistance, 11: 5107(P)
Cells
(See Animal cells; Dry batteries; Photoelectric cells; Plant cells; Storage batteries.)
Cellulose
ignition and thermal radiation damage, 11: 7359
radioinduced degradation, 11: 6673(J)
Cellulose acetates
vacuum forming, 11: 4850
Cements
(See also Binders; Concretes.)
radiation effects, 11: 8747(R)
radiation effects on Parian construction mixtures in Redox solutions, 11: 7459
Central City District (Colo.)
geology of Wood and East Calhoun Mines in, 11: 12045(J)
paragenesis and structure of pitchblende-bearing veins in, 11: 3826(J)
Centrifugal pumps
(See also Rotary pumps.)
design for alkaline solutions, 11: 1058
liquid-metal, development for, 11: 2465, 2895
Centrifugation
effects on electrochemical potentials, 11: 1767(J)
Centrifuges
design for separation of U^{235} from U^{238}, 11: 8987(J)
design of two-piece crucible for, to handle microchemical precipitates, 11: 13281(J)
feasibility study of canned rotor, for homogeneous reactors, 11: 8627
operating characteristics for solvent extraction, 11: 1827(J)
Ceramic binders
properties of high alloy, 11: 6347
temperature-resistant, development from ceramic-oxide, glassy-bond coatings, 11: 1514(R)
Ceramic bodies
(See also main headings for specific ceramic bodies by name of materials.)
fixation of radioactive wastes by incorporation into, 11: 6318
sorptive properties for radioisotopes, 11: 8432
Ceramic coatings
(See also Porcelain enamels; Refractory coatings.)
deposition on metals for high temperature service, methods, 11: 11179(R)
high-temperature properties at 1200 to 1700°F and above, panel on, 11: 4881
polymorphic modifications of SiO_2 in, 11: 5858
radiation-reflective and corrosion-resistant, 11: 4857
temperature-resistant, of long heat stability, 11: 4856
Ceramic crucibles
fabrication from Ce_2S_3, 11: 7176
Ceramic enamels
See Porcelain enamels.
Ceramic–gas systems
coolant and thermodynamic properties for nuclear reactors, 11: 1317
uses in nuclear power generation, 11: 12456(R)
Ceramic insulators
for electromagnetic pump coils, electric conductivities, 11: 2475
Ceramic materials
(See also specific compounds; see also materials by common names, e.g., Graphite and Glazes. See also Refractory materials; Reactor fuel elements (ceramic).)
blocks with parallel passages for heat exchanger construction, 11: 6586(P)
corrosion by U and U alloys, 11: 12716
corundum, microstructure control, 11: 7987(J)
density and crystal structure, radiation effects on, 11: 7406(R)
development for high-energy storage capacitors, 11: 11243(R), 12242(R)
development of high-temperature resistant structural adhesives for, 11: 12024(R)
electric conductivity, 11: 7178
electric properties, circuit design for measurement, 11: 11297
electronic application, 11: 265(J)
fabrication into radomes, 11: 11178
ferroelectric, dielectric properties, effects of mechanical pressure on, 11: 7181(J)
hot pressed, gas-turbine application, physical properties, 11: 1065
insulation properties at elevated temperatures, 11: 1860(J)
mechanical strength at elevated temperature, 11: 7989(J)
physical properties, comparison of $BaTiO_3$, $Pb(NbO_3)_2$ and lead-zirconate titanate, 11: 7175
preparation and properties, 11: 11687(R)
properties, as related to reactor program, 11: 265(J), 12608(R), 13081
radiation effects, 11: 1922(R), 6713, 12025(J), 13578(R)
research and industrial development in China, review, 11: 7182(J)
research program bibliographies and summaries, 11: 3847

Ceramic materials (cont'd)
research, fundamental and general, 11: 265(J)
testing of high K for use as capacitors, 11: 3387(R)
thermal conductivity of single phase, effect of microstructure on, 11: 12728(J)
thermal expansion to 1500°C, 11: 1859(J)
thermal stresses, 11: 13779(R)
vessel linings, 11: 7392(P)
Ceramic–metal couples
metallizing for vacuum-tight bond and test specifications, 11: 2474
Ceramic–uranium oxide systems
radiation effects, 11: 13705
Cerium
amperometric determination in presence of other elements, 11: 11944(J)
amperometric titration of Ce^{3+} with ferricyanide, 11: 4306(J)
antiferromagnetism and phase changes at low temperatures, 11: 1278(R)
atomic heat between 1.5 and 20°K, 11: 8228(J)
coulometric determination with Tl^{3+}, 11: 941(J)
determination in Thorex Process streams, 11: 3697
determination using liquid–liquid extraction, 11: 4296(J)
electric conductivity and phase studies, as a function of temperature, 11: 10359(J)
heat of phase transformation under pressure, thermographic determination, 11: 9520(J)
magnetic susceptibility from 1.5 to 300°K, 11: 9171(J)
melting, performance of sulfide crucibles, 11: 10870
photometric determination, 11: 1442
physical and chemical properties, 11: 5816(J), 5865(J)
preparation, 11: 8269(R)
preparation from CeF_3 by bomb reduction, 11: 7673(R)
radiometric determination in water, 11: 8870
reactions with Sn^{2+} in aqueous H_2SO_4 solution, kinetics, 11: 974(J)
separation and determination in Ti by bromination, 11: 12675
separation from U by organic coprecipitation, 11: 9265(J)
separation from UO_2SO_4 solutions by sorption, 11: 7837(R)
solubility in Tl, 11: 2931(J)
solvent extraction, 11: 4359, 7675, 7969, 8380(R), 11123, 11627, 12973(R), 13564(R)
spectrographic analysis for Th, 11: 4810(R)
spectrographic determination in Mg, 11: 3705(J)
surface tension and chemical reactions with refractory materials, 11: 2420(R), 2851
tissue distribution and toxic effects in rats, tracer study, 11: 12959(R)
volumetric determination in Bi base alloys, 11: 11937(J)
volumetric determination in Ce–Th alloys, 11: 3694
volumetric determination in Ce–Zr alloys, 11: 3693
Cerium–aluminum alloys
See Aluminum–cerium alloys.
Cerium chlorides
reduction and dehydration, 11: 8269(R)
thermodynamic properties and stability, 11: 7734(R)
Cerium complexes
with thiourea, 11: 10031(J)
Cerium compounds
preparation and properties of alkoxides, 11: 174(J)
radiation effects of 200 kv x rays and Co^{60} γ rays on dilute aqueous solutions, 11: 7133(J)
Cerium fluorides
preparation from $CeCl_3 \cdot 6H_2O$, 11: 7673(R)
Cerium iodates
crystal structure, 11: 1785(J)
Cerium ions
exchange reactions between Ce^{+4} and Ce^{+3}, 11: 91(J), 1808
polymerization of Ce^{3+}–Ce^{4+} in HNO_3 solutions, 11: 5248(J)
Cerium(III) ions
complexing by fluoride ions in aqueous solution, 11: 11113(J), 11966(J)
oxidation to Ce^{4+}, 11: 11055(R)
photometric titration in presence of Ce^{4+}, 11: 1442
reactions with Co^{3+} in $HClO_4$ solutions, 11: 175(J)
reactions with 2-methyl-8-quinolinol, 11: 6287(J)
ultraviolet spectrophotometric determination, 11: 13276(J)
Cerium(IV) ions
photoreduction in H_2SO_4, effect of Tl^+, 11: 10462(J)
reduction by formic acid induced by γ radiation, kinetics, 11: 9252(J)
reduction due to γ irradiation, effect of Tl^+ on, 11: 8286(R), 11576(R)
Cerium isotopes
chemical effects on tissues and metabolism in animals, 11: 7055(J)
Cerium isotopes Ce^{137}
decay properties, 11: 8286(R), 11576(R)
Cerium isotopes Ce^{139}
decay properties, 11: 11576(R)
Cerium isotopes Ce^{141}
decay properties, 11: 5671(J)
Cerium isotopes Ce^{144}
applications in β applicators, 11: 3316(J)
bone deposition in dogs, 11: 7291(R)
contamination level in marine animals and land plants exposed to fall-out, 11: 9192
detection and measurement in plants, 11: 11048(J)
gamma spectra, 11: 9752(R)
half life, 11: 1292(J), 3526(J), 9587(R)
radiometric determination, 11: 6277(J)
Cerium–lanthanum alloys
specific heats and magnetic susceptibilities at low temperatures, 11: 9170(J)
Cerium–magnesium alloys
creep behavior, effect of alloying elements on, 11: 5349
Cerium nitrates
crystallographic data for $Ce(NO_3)_4 \cdot 5H_2O$, 11: 1451
thermolysis, 11: 972(J)
Cerium oxide–uranium oxide systems
physical properties of sintered, 11: 7601
sintering, 11: 12000(R)
Cerium oxides
formation in UO_2 drossing of irradiated U, equilibrium constants and free energy values, 11: 5260

Cerium sulfates
analytical uses in volumetric determination of U in UF_4, 11: 7589
radiation and temperature effects, 11: 9587(R)
radio-reduction, effects of H^+ concentration on, 11: 8284(R)
Cerium sulfide crucibles
development, 11: 7177
Cerium sulfides
electric and thermal conductivity of Ce_2S_3, 11: 7178
preparation and sintering for crucible fabrication, 11: 7176
preparation of CeS, 11: 7177
sintering of compacts, 11: 7177
Cerium–thorium alloys
preparation by reduction of ThF_4 with rare earth chloride and phase studies, 11: 8507(R)
volumetric analysis, 11: 3694
Cerium–titanium alloys
constitution diagrams, 11: 2931(J)
Cerium–zirconium alloys
volumetric analysis for Ce and Zr, 11: 3693
Cermets
(Specific cermets are indexed as Systems, and the names of the constituents are arranged in alphabetical order.)
bibliography on development of, 11: 10073
coatings of high temperature brazes, 11: 7180
development and properties, 11: 12020
development for use in chemical industry and reactors, 11: 7995(J)
diffusion bonded coatings of Ni alloys, 11: 7180
electroplating with Cr and Ni, 11: 10523
fabrication and physical properties of, for high temperature reactor use, 11: 6713
fabrication of stainless-steel clad, 11: 1513
impact behavior, 11: 10557
impact resistance, effect of metallic coatings on, 11: 7180
industrial uses, thermal properties, 11: 5336, 5337
oxidation of cobalt–alumina mixtures, 11: 263(J)
preparation with CrB, TiB, and WB, 11: 6716(J)
production and engineering properties of cobalt alloy–TiB_2 and nickel alloy–TiB_2, 11: 6347
properties of BeO–Nb, 11: 3388
Cesium
absorptiometric determination, 11: 10002(J)
absorption spectra in presence of gases, 11: 6651(J)
activation determination in rocks, minerals, and meteorites, 11: 9232(J)
chromatographic separation of, and Rb, analytical uses, 11: 10482(J)
constricted discharge characteristics, theory, 11: 10135
cosmic abundance in stony meteorites, 11: 10032(J)
determination by complex cobaltcyanide precipitation, 11: 11084
determination in Thorex Process streams, 11: 3697
determination of low concentrations of radioactive, in water, 11: 10003(J)
flame photometric determination in Bi and Bi–U, 11: 6252
ion exchange, 11: 9255(R)
Cesium (cont'd)
ion exchange removal from reactor solutions, 11: 7536(R)
metabolism, tracer studies, 11: 4809(J), 5134(R), 8257(R), 9576(R), 11021(R)
neutron total cross sections and resonances in kev region, 11: 4047(J)
radiochemical determination in reactor fuel solution, 11: 12343
radiometric determination in water, 11: 8870
separation and determination in solutions, 11: 115(J), 1026, 3237(P), 5818, 8435(R)
separation by ion exchange from fission product wastes, 11: 10473(R)
separation from Ru, Te, and rare earths using anion exchange, 11: 9263(J)
solvent extraction of carrier-free, 11: 5365(R)
spectrographic determination in beryls, mica, and feldspars, 11: 11933(J)
spectrographic determination in high Fe and Na concentrations, 11: 3340
Cesium chlorides
chromatographic separation from alkali metal halides using C_6H_5OH–CH_3OH–HCl, 11: 4830(J)
preparation, 11: 12664
radiolysis by electrons, 11: 4345
Cesium compounds
crystallography of Cs_2TeI_6, 11: 1787(J)
existence of Cs_2PoI_6, 11: 1786(J)
Cesium iodide crystals
thallium activated, response to nitrogen ions, α particles, and γ rays, 11: 12815(J)
thallium activated for scintillation spectroscopy, 11: 9016(J)
Cesium iodides
photoelectric emission, 11: 3215(J)
Cesium ions
bombardment effects of positive, on Ta and Ni ion emissions, 11: 1945(J)
penetration into Ge, 11: 9347(J)
self-diffusion in polysterenesulfonated solutions, 11: 9587(R)
Cesium isotopes
determination of natural distribution in contemporary man, 11: 9001(J)
nuclear spins, nuclear magnetic moments, and hyperfine structure separations, 11: 11361
Cesium isotopes Cs^{127}
decay schemes, 11: 627(J)
nuclear spin, 11: 3041(J)
Cesium isotopes Cs^{129}
decay schemes, 11: 627(J)
nuclear spin, 11: 3041(J)
Cesium isotopes Cs^{130}
nuclear spin, 11: 3041(J)
Cesium isotopes Cs^{131}
energy levels, 11: 2059(J)
radiative electron capture, 11: 1380(J)
Cesium isotopes Cs^{132}
decay schemes, 11: 3614(J)
Cesium isotopes Cs^{133}
coulomb excitation levels, 11: 6865(R), 12068(R)

Cesium isotopes Cs^{133} (cont'd)
hyperfine structure, 11: 1309(J), 1920(R), 4641(J), 10703(J)
nuclear spin, 11: 9752(R)
Cesium isotopes Cs^{134}
decay schemes, 11: 772(J), 4056(J), 9161
half life, 11: 3526(J), 6054(J)
magnetic moments and hyperfine structure anomalies, 11: 4641(J)
Cesium isotopes Cs^{135}
magnetic moments and hyperfine structure anomalies, 11: 4641(J)
Cesium isotopes Cs^{136}
decay schemes, 11: 10996(R)
Cesium isotopes Cs^{137}
absolute yield in fast fission of U^{235} and Pu^{239}, 9581(R), 11309(J)
applications in kilocurie teletherapy machine, 11: 11900(J)
as beta source for phosphor activation, 11: 10183(J)
beta spectra and conversion coefficients, 11: 11333(J)
beta transition, 11: 7406(R)
contamination level in marine animals and land plants from fall-out, 11: 9192
contamination of foodstuffs and people from atomic explosion fall-out, 11: 9943(J)
decay, beta interaction in, 11: 9512(J)
detection and measurement in plants, 11: 11048(J)
as gamma source in radiography of steel, 11: 4449
gamma sources for radiography, calibration, 11: 11311(J)
gamma spectra, 11: 10996(R)
magnetic moments and hyperfine structure anomalies, 11: 4641(J)
pathological effects of ingested, in rats, 11: 11877(R)
precipitation, 11: 9987(R)
radiometric determination, 11: 942(J), 4286, 5171, 8792(R)
radiometric determination in human subjects by external counting, 11: 7291(R)
recovery from radiochemical wastes, 11: 2242(R), 5292(J), 12718
separation of carrier-free, from fission products by coprecipitation, 11: 11122
tissue distribution following intraperitoneal injection in rats, 11: 12660
Cesium isotopes Cs^{144}
pathological effects in rats, 11: 3283(J)
Cesium sulfates
radiolysis by electrons, 11: 4345
solubility, 11: 12584(R)
solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)
Cesium thorium chlorides
crystal structure of Cs_2ThCl_6, 11: 946(J)
Cesium uranium chlorides
crystal structure of Cs_2UCl_6, 11: 946(J)
Cesium zinc ferrocyanides
properties and conversion to cesium chlorides, 11: 12664
Chain reactions
(See also Criticality studies; Multiplication Factor.)
asymptotic theory of slow neutron, 11: 1656
transmutation of uranium, computation concerning conditions for, 11: 9488(J), 9489(J)
in uranium oxide spheres, 11: 9055(J)
Charcoal
(See also Carbon (activated).)
adsorptive properties of beds in Homogeneous Reactor Experiment, 11: 8610, 11129
adsorptive properties for U, 11: 2364
Charged particle beams
(See also beams of specific ions.)
current measurement, probe design, 11: 7029(P)
extraction from accelerators by regenerative method, 11: 4137(J)
extractor design for accelerators, 11: 9566(P)
focusing device for Harwell f-m cyclotron, 11: 4135
focusing with quadrupole magnets, 11: 4918
intersecting, properties, 11: 3185(J)
measurements, instrument design, 11: 10367(J)
production of secondary, in Bevatron with thin foils, 11: 4723
spin kinematics in a uniform magnetic field, 11: 8966(J)
spreading of circular cross-section, due to beam space charge, 11: 7350(J)
Charged particles
acceleration, coherent principle, 11: 15(J), 3185(J)
acceleration, multielectrode system for, 11: 11459(J)
angular and energy distribution measurements in pulse ionization chamber, 11: 12816(J)
applications in radioisotope production, 11: 12798
detector design for heavy, 11: 3974(J)
electron pairs created by fast, cross sections, 11: 4026(J)
energy determinations of star producing, test of median angle method, 11: 512(J)
energy loss calculations for, moving through an anisotropic medium, 11: 7375(J)
energy loss of fast, 11: 12307(J)
energy losses on traversing ionized gas, 11: 5381(J)
identification of fast, in nuclear emulsions, 11: 6822(J)
interactions with electromagnetic waves, 11: 427(J)
ionizing capacities in bubble chamber, 11: 3003(J)
masses of nonrelativistic, measured in nuclear emulsions, 11: 591(J)
momenta of high-energy, measured in diffusion cloud chambers, 11: 6476(J)
momentum determination using emulsion spectrograph, 11: 4945(J), 4946(J)
motion and total energy losses in an optically active anisotropic medium, 11: 2210(J)
motion in spirally ridged FFAG accelerator, 11: 716, 3155
motion of exact and approximate differential equations for, 11: 3155
nuclear excitation by, 11: 5497(J)
nuclear scattering of, analysis of data, 11: 3096(J)
penetrabilities, tables, 11: 10633
production in nuclear collisions, 11: 696(J)
removal by application of radioactive substances, 11: 10116(J)
scattering by nuclei in intermediate energy region, 11: 13545(J)
scattering paths of, graphical determination, 11: 1679(J)
system of, Lagrangian function for, 11: 12948(J)
stopping in stripped emulsions, 11: 3960(J)
trajectories in electrostatic fields, 11: 1385(J), 3630(J)

Chattanooga shale
leaching for U recovery, 11: 7145(R)
oxidation of uraniferous black, 11: 9273(J)
uranium recovery by leaching and chlorination, 11: 3760
Chattanooga shale (Tenn.)
uranium distribution in Eastern Highland Rim, Youngs Bend Area, 11: 3406
Chelates
(See also organic compounds used as chelation agents; see also by name of metal chelated, e.g., Uranium chelates.)
bibliography on applications of derivatives of iminodiacetic acid known as complexones as, 11: 917(J)
formation and stability, 11: 1436(J)
formation of $Ce(C_{10}H_8NO)_4$, 11: 6287(J)
therapeutic uses in radioelement poisoning, 11: 893
of uranium with di(salicylal) alkylene diimines, 11: 5095(P)
Chelation
continuous, feasibility for separation processes, 11: 13708
Chemical analysis
(See also specific methods of analysis.)
manual of procedures used at Y-12 plant for SF materials accounting, 11: 12342
manuals used at Arco Chemical Plant, 11: 2826
precipitation techniques, 11: 1007(J)
radio, application of micro methods to, 11: 5210
spectrochemical using graphite as base, matrix or extravenous element effects, 11: 4310(J)
theory of chelate formation, 11: 1436(J)
Chemical Corps. Engineering Agency, Army Chemical Center, Md.
reports on statistical engineering symposium, April, 1955, 11: 1499
Chemical prophylaxis
prophylactic effects of adrenaline with acetylcholine in radiation sickness of mice, 11: 9968(J)
of radiation sickness by cysteinamine, 11: 10417(J)
Chemical radiation detectors
(See also Radiation detection instruments (colorimetric).)
calibration, 11: 2233(R), 2989(J), 9576(R)
design, 11: 505(J), 1985(J), 1994(J), 2233(R), 12142(J)
development, 11: 6596(R), 8266(R), 9916(R)
development of Ag-activated phosphate glass type, 11: 9018(J)
development of chlorinated hydrocarbon systems for use as dosimeters, 11: 10646
development of gel dosimeters for depth-dose measurements, 11: 7277(J)
development of trichloroethylene-dye dosimeters, 11: 7398(R)
performance, 11: 2237, 2239, 6469, 10803(R), 12960(R), 13566(R)
performance for dosimetry, 11: 7695(R), 8258(R), 8259(R)
performance of chloroform–resorcinol systems as, 11: 12517(R)
performance under field conditions, 11: 12961(R)
radiation effects, 11: 13565(R)
Chemical reactions
design of all-metal system for studying, 11: 6666(J)
Chemicals and reagents
(See also specific chemicals and reagents; see also Oxidizing agents.)
Chemicals and reagents (cont'd)
analytical characteristics, literature review, 11: 1436(J)
azoxine indicators for complexometric titration of Cd, Co, Cu, Pb, Ni, Th, rare earths, 11: 6261(J)
permeation into polyethylene bottles, radiation effects, 11: 1413(R), 1414(R)
physical properties, 11: 5184
spectrophotometric study of UO_2^{2+} complexes with reductone, 11: 9272(J)
toxicity, flashpoint and flammability, 11: 12667
Chemical Research Lab., Metal Hydrides, Inc.
progress reports on the preparation of uranium hydride, 11: 12429(R)
Chemiluminescence
See Luminescence.
Chemistry
(See also Biochemistry; Geochemistry; Histochemistry; Nuclear chemistry; Organic chemistry; Radiation chemistry; Radiochemistry.)
applications in atomic energy, 11: 1800(J)
investigation of chemical systems by electron-spin resonance, 11: 3683(J)
research, use of oxygen isotopes in, 11: 5197(J)
Chemistry conferences
(See also Radiation chemistry conferences.)
Chemotherapy
augmentation of radiotherapeutic effects by, in cancer, 11897(J), 11899(J)
of cancer, a bibliography of agents, 11: 1722(J)
of chronic leukemia with urethane and embeklin, 11: 8808(J)
of radiation injuries, 11: 7923(J)
Cherenkov detectors
design and operation of various, 11: 3003(J)
design of cosmic-ray, with adjustable velocity threshold, 11: 3492(J)
design of total absorption, 11: 5462(J)
efficiency of liquid, effect of ultraviolet converters, 11: 5974(J)
scintillation intensity of media for, 11: 3965(J)
slug rupture detected with, 11: 3491(J)
Cherenkov radiation
bibliographies, 11: 6492
generation of millimeter waves by, apparatus for, 11: 1383(R)
in isotopic media and crystals, theory, 11: 12308(J)
from muons of 84 Mev to 4.2 Bev passing through Plexiglass, 11: 6383(J)
of neutral particles with a magnetic moment, 11: 3031(J)
theory of, in electronic plasma in a magnetic field, 11: 6433(J)
use of Cherenkov effect in producing cm or mm waves, 11: 4754(J)
Chicago
meteorology, 1949 to 1954, 11: 6000
Chicago. Univ. Air Force Radiation Lab.
progress reports on biological studies, 11: 2779(R), 4226(R), 9915(R), 11841(R)
Chicago. Univ. Metallurgical Lab.
progress reports, 11: 7664(R), 7665, 8487(R), 8543(R), 10838(R), 10891(R), 11656(R), 13024(R)
progress reports on Al corrosion, 11: 7613(R)
progress reports on chemical research, 11: 11566(R), 11620(R)

Chicago. Univ. Metallurgical Lab. (cont'd)
progress reports on coatings and corrosion, 11: 8450(R)
progress reports on electroplating U, 11: 8485(R)
progress reports on metallurgy, 11: 7654(R), 7655(R), 7663(R), 7666(R), 13784(R)
progress reports on plutonium metallurgy, 11: 7516(R), 7517(R), 7522(R), 8277(R)
progress reports on radiation chemistry, 11: 4163(R), 7456(R), 7457(R)
Chinle Formation
stratigraphy of, in upper triassic strata in southeastern Utah, 11: 6723(J)
Chinle Formation (Ariz.)
uranium distribution, 11: 10083
Chinle Formation (Utah)
comparison of the pebbles of the Shinarump and Mossback members of, 11: 10543(J)
Chlorates
exchange of Cl between perchlorates and, 11: 9664(R)
spectra, Zeeman effect on quadrupole, 11: 7373(J)
Chloride complexes
(See also specific chloride complexes, e.g., Boron chloride complexes.)
formation of $HTlCl_4$ and ether extraction, 11: 4843
with plutonium(VI), absorption spectra, 11: 11138(J)
separation by ion exchange on Dowex-A1, 11: 11586(R)
with uranium, absorption spectra, 11: 3775(J)
with Zr, Hf, Nb, and Ta, anion exchange, 11: 2254(R)
Chloride ions
potentiometric determination in Ti sponge, 11: 1440
Chlorides
(See also specific chlorides.)
complex formation and electrical conductivity of fused, 11: 5191(J)
complex formations and electrical conductivity of LiCl, NaCl, $CaCl_2$, $MgCl_2$, $LiCl_3$, YCl_3, $BeCl_2$, $AlCl_3$, BCl_3, and $SiCl_4$, 11: 96(J)
coulometric determination, 11: 11586(R)
determination by indirect flame photometric method, 11: 2835(J)
optical properties and x-ray diffraction data for inorganic, 11: 1202
oxidation by $K_2S_2O_8$, 11: 7528
path in HNO_3 recovery in TBP Process, 11: 8369
potentiometric determination in Zr metal, 11: 2280
removal from raffinate materials by oxidation, 11: 7424
spectrophotometric determination in $Th(NO_3)_4$, 11: 10812(R)
titrimetric determination in aqueous solutions, 11: 12339(R)
turbidimetric determination, 11: 2826, 2827
Chlorides (liquid)
melting point data for several systems, 11: 12666(R)
phase studies of systems $FeCl_2$–KCl and $FeCl_2$–LiCl, 11: 7933
Chlorine
activation determination in petroleum, 11: 8296(R)
atomic, preparation of, 11: 13575(R)
corrosive effects, bibliography, 11: 280(J)
corrosive effects, metal resistance to, containing water vapors, 11: 1916(J)
Chlorine (cont'd)
determination in soda salt, black oxides, tails, and cakes, 11: 1772
electrode potentials in fused chlorides, 11: 1416(J)
exchange between $SnCl_4$ and 2-chlorobutane, 11: 2822(J)
exchange reactions with HCl on glass and fluorocarbons, 11: 1423
fluorination to ClF_3 at 280°C, 11: 2289
gravimetric determination in U and U ores, 11: 2400
neutron activation determination, 11: 11586(R)
neutron capture cross sections, thermal, 11: 12199(J)
neutron cross sections, 11: 1276(R), 2087(J), 4047(J)
radiation-induced exchange with CCl_4, 11: 12688(J)
Chlorine compounds
magnetic properties and microwave spectra, 11: 12970(R)
Chlorine fluoride–hydrofluoric acid systems
phase diagram for ClF_3–HF, 11: 4833
phase studies, 11: 8303, 11100(J)
vapor pressure and specific conductance, 11: 5231
Chlorine fluorides
conversion of U compounds to UF_6 using, 11: 10847
distillation of HCl–ClF_3 systems at low temperatures, 11: 9210
fluorination of metallic U with, 11: 10846
preparation and properties, 11: 143
preparation by regeneration of reduction products, 11: 12374
preparation by vapor-phase reaction of F_2 with Cl_2, 11: 2289
purification and solubility in hydrofluoric acid, 11: 8303
reactions of gaseous with UF_4, 11: 10848
solvent properties for U, 11: 3367(J)
Chlorine isotopes
magnetic properties, 11: 12970(R)
relative abundance, 11: 1973(J)
separation, 11: 9664(R)
Chlorine isotopes Cl^{31}
abundance, 11: 1973(J)
Chlorine isotopes Cl^{34}
decay schemes, 11: 5069
Chlorine isotopes Cl^{35}
deuteron reactions (d,p), angular distribution of protons from, 11: 4719(J)
energy levels, 11: 1542(R)
line width and frequency in ethylene chloride, 11: 8284(R)
neutron resonances in kev region, 11: 6065(J)
nuclear induction line in liquids, quadrupole widening, 11: 601(J)
nuclear quadrupole resonance in heterocyclic compounds, 11: 3029(J)
proton reactions (p,γ), 11: 4717, 9143(J)
quadrupole resonance in chlorates, 11: 11576(R)
Chlorine isotopes Cl^{36}
energy levels, 11: 8562(R)
nuclear spin and quadrupole moment, 11: 11574(R)
occurrence in pitchblende of Great Bear Lake District, 11: 5952(J)
preparation, 11: 12330(R)

Chlorine isotopes Cl^{36} (cont'd)
presence in nature, 11: 5374(J)
Chlorine isotopes Cl^{37}
energy levels, 11: 1542(R)
neutron reactions (n,p), excitation curves, 11: 9140(J)
proton reactions (p,γ), 11: 4717, 9143(J)
Chlorine isotopes Cl^{38}
angular correlations in β-γ cascade, 11: 1699(J)
decay schemes and half lives, 11: 8283(R)
Chlorine isotopes Cl^{39}
decay scheme, 11: 1696(J)
Chlorine oxides
chemical reactions of Cl_2O_6 with F_2, 11: 7120(J)
Chloroform
hydrogen bond dissociation, 11: 1460(J)
uses in chemical dosimeters, 11: 505(J)
Chloroform–acetic acid–water systems
See Acetic acid–chloroform–water systems.
Chlorohydrocarbons
efficiency in chemical radiation detectors, 11: 12517(R)
Chlorophylls
radioautographic determination, factors affecting specific activity, 11: 4814(R)
Cholesterol
metabolism, 11: 66, 4221, 5182(J), 12642(R), 13229(R)
paper chromatography, 11: 12341(R)
radiation induced oxidation, 11: 961(J)
tritium labeled, stability, 11: 5182(J)
Choline
ionizing radiation effects on analogs, 11: 3330(R), 4814(R)
Choline chloride
crystal structure, 11: 1781
radiation effects, 11: 7091(R)
Cholinesterases
acetyl-, radioinduced inactivation, 11: 2781(J)
effects of diisopropylfluorophosphate on brain levels of, in rats, 11: 4814(R)
radiosensitivity, 11: 12(R), 1727(J), 1728(J), 3281(J), 4244(J)
Chromate ions
as corrosion inhibitors, electrochemical properties, 11: 11576(R)
reactions with Br^- and Tl^+, effects of γ irradiation on, 11: 11576(R)
Chromates
(See also specific chromates.)
formation in high-pressure water systems, 11: 10291(R)
radiation chemistry, 11: 166, 13626, 13985(R)
reduction of dichromate in aqueous solutions, radiation effects on, 11: 7456(R)
Chromatographic separations
of gaseous hydrocarbons and of inert gases, 11: 113(J)
Chromatography
(See also Electrochromatography.)
Chromatography (cont'd)
constant flow-rate device for electrolyte eluants, 11: 5841
of gases, method of quantitative determination, 11: 933(J)
of radioactive compounds, modified end-window counting tube for direct counting, 11: 1997(J)
separation of Th and Zr by paper, 11: 11988(J)
tracer techniques, 11: 2986(J), 12642(R)
Chromic acid
corrosive effects, 11: 12585(R)
micro-analysis, 11: 111(J)
thermal decomposition and properties of resulting solid phases, 11: 5198(J)
Chromium
adhesive bond strength of, electrodeposited on steel, 11: 335
analysis for O_2 by bromination-carbon reduction method, 11: 921
anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)
as base metal for oxidation and liquid Na resistant brazing alloys, 11: 275(R)
chromatographic separation of, and Ti, 11: 10484(J)
colorimetric determination by diphenyl carbazide method, 11: 10815(R)
corrosion and wear, data for water-cooled reactors, 11: 12028
corrosion by Bi, 11: 7655(R)
corrosion inhibitors for, 11: 10987(R)
corrosion of waste evaporator by, 11: 13749
corrosion protection of Cr-clad steel in 300 to 650°F H_2O, 11: 13751
corrosive effects of reactor coolants on, effect of O content on, 11: 2487
coulometric determination in standard $K_2Cr_2O_7$ solutions, 11: 10444(J)
determination in Cr–U–V alloys, 11: 13606
determination in homogeneous reactor solutions, 11: 4292(J)
determination in Zr, 11: 8517(R)
deuteron reactions, nuclear excitation functions and thick target yields, 11: 1672(J)
ductile, high-temperature use, corrosion, 11: 348(J)
electrodeposition on cermets, 11: 10523
electrodeposition on steel, adhesive bond strength, 11: 335
electrodeposition on Th, 11: 13783
electrodeposition on Zn-coated U, 11: 7673(R)
electrodialysis, 11: 987
forging, machining, melting, and plastic flow of unalloyed, 11: 4888
Hall effect in, at room temperature with fuels up to 30 kilo-oersteds, 11: 5342
heat capacity at low temperatures, 11: 1913(J)
high-temperature corrosion by water, 11: 13067(R)
neutron reactions, 11: 6856, 10554
neutron resonances, 11: 550(R)
neutron scattering at 4.4 Mev, 11: 3592
neutron scattering spectra, 4.4 Mev, 11: 2022(J)
oxidation over temperature range 700 to 1100°C, kinetics of, 11: 7994(J)
phase diagram of recrystallization, 11: 1890(J)
polarographic determination in reactor fuels, 11: 8296(R), 8297
recovery, reduction, and radiation effects, 11: 8283(R)

Chromium (cont'd)

soft x-ray absorption by thin films, 11: 10774(J)

solubility in bismuth, 11: 9983(R), 13885(R)

solubility in liquid Bi, 11: 7691(R), 7734(R)

solvent extraction from acidic solutions of alkali metal salts using trioctyl-phosphine oxide, 11: 9224

solvent extraction from ferrous materials using acetylacetone, 11: 10442

solvent extraction with trioctylphosphine oxide, 11: 10476

spectrographic determination in Bi and Bi–U alloys, 11: 4283

spectrophotometric determination as diphenylcarbazide complex, 11: 9224

thermal conductivity, heat capacity, and thermal expansion at high temperatures, 11: 327

thermal properties of, bibliography, 11: 331

toxicity in plants, 11: 64

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

Chromium alloys

corrosion in liquid Mg, Pb, and U–Bi alloys, 11: 7734(R)

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

Chromium–aluminum–iron–molybdenum–titanium alloys
See Aluminum–chromium–iron–molybdenum–titanium alloys.

Chromium–aluminum–iron–titanium alloys
See Aluminum–chromium–iron–titanium alloys.

Chromium–aluminum–molybdenum alloys
See Aluminum–chromium–molybdenum alloys.

Chromium–aluminum–nickel–titanium alloys
See Aluminum–chromium–nickel–titanium alloys.

Chromium–aluminum oxide compacts
See Aluminum oxide–chromium compacts.

Chromium–aluminum oxide systems
See Aluminum oxide–chromium systems.

Chromium–aluminum–silicon coatings
See Aluminum–chromium–silicon coatings.

Chromium–aluminum–titanium alloys
See Aluminum–chromium–titanium alloys.

Chromium–antimony alloys
See Antimony–chromium alloys.

Chromium borides

heat of formation, 11: 8909(J)

preparation of cermets with Co, Ni, and Fe, 11: 6716(J)

Chromium–boron–iron–nickel systems
See Boron–chromium–iron–nickel systems.

Chromium–boron–nickel systems
See Boron–chromium–nickel systems.

Chromium carbonyls

preparation and properties, 11: 1011(J)

Chromium coatings

corrosion of carbon steel samples with, 11: 10879

preparation by electrophoretic deposition, 11: 8514(R)

on uranium, effectiveness as "blocking layer" to prevent U diffusion during Al–Si hot dip, 11: 8485(R)

vapor deposition on U, 11: 13776

Chromium–cobalt alloys

diffusion parameters in K-spectra absorption in, 11: 344(J)

Chromium–cobalt–iron–nickel alloys

high-temperature creep-rupture properties, 11: 323

Chromium–cobalt–nickel alloys

effect of crucible materials on high-temperature properties of vacuum-melted, 11: 11204

Chromium compounds

crystal structure of $HCrO_2$, 11: 10005(J)

Chromium–europium oxide–iron–nickel systems

separation of Eu_2O_3 from, laboratory procedure for, 11: 10824

Chromium–gold alloys

Hall effect and resistance at low temperatures, 11: 4483(J)

Chromium ions

corrosion inhibiting effects of, on Zircaloy-2, 11: 6349

paramagnetic resonance and optical absorption spectra of, in MgO, 11: 5544(J)

Chromium–iron alloys

diffusion coefficients, 11: 6402(J)

x-ray spectra in magnetic transformation, 11: 10572(J)

Chromium–iron–molybdenum alloys

corrosion by liquid Bi–U, 11: 13884(R)

phase studies at 1050 to 750°C, 11: 9335(J)

Chromium–iron–molybdenum–nickel alloys

corrosion resistance, mechanical properties, and metallurgy, 11: 13325(J)

mechanical and corrosion properties, 11: 12058

phase diagrams, 11: 3869(J)

structure changes under tensile stress at 500°, electromicroscopic investigation of, 11: 1147(J)

thermal expansion, 11: 12794

welding to stainless steel, 11: 9328

Chromium–iron–molybdenum–titanium alloys

mechanical properties and stability, effects of thermal exposure, 11: 322

Chromium–iron–molybdenum–vanadium alloys

tensile, rupture, stress, and creep properties at 1000 and 1100°F, after heat treatment, 11: 3839

Chromium–iron–nickel coatings

preparation, 11: 13093(R)

Chromium–iron–titanium alloys

tensile strength at 650°C, 11: 7626(R)

Chromium isotopes

formation during irradiation of stainless steel, 11: 10554

Chromium isotopes Cr^{48}

decay properties, 11: 551

Chromium isotopes Cr^{49}

decay properties, 11: 626(J)

Chromium isotopes Cr^{51}

application in blood volume determinations, 11: 7926(J)

energy levels, 11: 602(J), 626(J), 1292(J)

Chromium isotopes Cr^{52}

energy levels, 11: 6863(R), 12186(R)

Chromium isotopes Cr^{54}

neutron capture reactions in, search for successive, 11: 4978(J)

Chromium isotopes Cr^{55}

pile neutron capture cross sections, 11: 4978(J)

Chromium–molybdenum–nickel alloys

corrosion resistance, mechanical properties, and metallurgy, 11: 13325(J)

crystal structure of P phase and atomic coordination, 11: 3709(J)

use for welding electrodes, 11: 1537

Chromium–molybdenum–nickel steel

weldability, tensile properties, corrosion, and microstructure, 11: 12740

Chromium–molybdenum–silicon systems

physical properties, 11: 3412(R)

stress-to-rupture life and impact resistance, 11: 324

x-ray-diffraction patterns of arc melted, 11: 1119(R)

Chromium–molybdenum steel

creep, 11: 9333(J)

creep resistance in annealed, normalized, tempered, and cold-worked conditions, 11: 6373

evaluation of weld joints of type 304 stainless steel to, 11: 1879

Chromium–molybdenum–titanium alloys

heat treatment, stability, and microstructure, 11: 6743

Chromium–molybdenum–uranium alloys

centrifugal casting, 11: 7641

mechanical properties, 11: 12317(R)

Chromium–nickel alloy–aluminum–nickel alloy couples
See Aluminum–nickel alloy–chromium–nickel alloy couples.

Chromium–nickel alloys

creep, effect of ceramic coating on, 11: 5307

ductile matrix, effect of TiC_2 reinforcing on creep and slip, 11: 301

effect of ultrafine dispersions on mechanical properties of heat-resisting alloys, 11: 2912

order-disorder transition in, 11: 10098(J)

oxidation, schematic diagram of, 11: 6165(J)

vacancy formation, energy of, 11: 11234(J)

Chromium–nickel coatings

preparation, 11: 8514(R), 13093(R)

Chromium–nickel steel

oxide scales on, structure, 11: 281(J)

Chromium–nickel–titanium alloys

heat resistance phase diagrams at 800°C, 11: 354(J)

Chromium oxide–thorium(IV) oxide–water systems

phase studies, 11: 7859(R)

Chromium phosphates

radioactive colloidal, tissue distribution and liver uptake following injection, 11: 1762, 6218

Chromium–silicon steel

corrosion, 11: 11715(R)

oxidation in air at elevated temperatures, 11: 282(J)

Chromium–silicon–titanium systems

physical properties, 11: 3412(R)

Chromium–silver–uranium alloys

phase studies, 11: 11704(R)

Chromium steel

carbide crystal measurements at various temperatures of tempering, 11: 345(J)

corrosion, 11: 7691(R)

corrosion by liquid Na and microstructure, 11: 5311

corrosion of Croloy by liquid Bi–Zr alloys, 11: 8445

heat treatment, internal friction in γ and α phases of, 11: 6401(J)

mechanical and corrosion properties of AISI types 410, 414, 431, and Croloy 16-1, 11: 12058

mechanical properties, radiation effects on, 11: 10353(R)

mechanical properties of 12% Cr, 11: 352(J)

preparation of, for reactor vessels, 11: 12214(R)

spectrographic analysis, 11: 12214(R)

Chromium–titanium alloys

phase studies, 11: 4467, 4468

tensile properties, effect of O, N, and C contaminants, 11: 1138(R)

Chromium–titanium boride systems

properties of high alloy, 11: 6347

Chromium–titanium–tungsten alloys

preparation and phase studies at 900 to 1200°C, 11: 6735

Chromium–uranium alloys

casting, phase diagrams, mechanical properties, and specific heat, 11: 7634

casting and grain size, 11: 7641

casting fuel elements of, 7681(R), 8467, 8469, 11710(R), 13806(R)

equilibrium diagram and mechanical properties, 11: 13771

grain size, effects of heat treatment on, 11: 7636

grain structure, effects of ternary additions and heat treatment on, 11: 7569

heat treatment, mechanical and physical properties, and microstructure, 11: 11695

isothermal decomposition, 11: 8679(R)

liquid metal extraction, 11: 7677(R)

mechanical properties, 11: 12317(R)

mechanical properties at elevated temperatures, 11: 12473(R)

phase studies and grain refinement, 11: 7727

physical properties, 11: 8520(R)

physical properties, effects of addition of Fe, Ni, and Mn on, 11: 7633

physical properties of low- and high-C, 11: 8470

preparation of dimensionally stable, 11: 9545(P)

radiation effects and thermal cycling of cast, 11: 7883

radiation effects on breaking, 11: 8743

solubility in Mg–Th eutectic alloys, 11: 11703(R)

tensile properties, evaluation of irradiated, 11: 13042

thermal conductivity and transformation temperatures, 11: 13824

thermal cycling, 11: 7637

transformation kinetics, 11: 12555(R)

Chromium–uranium alloys(clad)

radiation effects, 11: 7883

Chromium–uranium alloys (liquid)

corrosion of Nb and Ta by, 11: 7673(R)

corrosive effects on Ta crucibles, 11: 7676(R)

liquid metal extraction, 11: 7676(R)

Chromium–uranium–vanadium alloys

analysis for Cr and V, 11: 13606

Chromium–zirconium alloys

corrosion tests at elevated temperatures, 11: 1870

creep and rupture behavior, 11: 1524

Chromosomes

(See also Genetics; Mitosis.)

radioinduced aberrations, 11: 861(J), 4241(J), 4242(J), 5154(J), 5158(J), 7049(J), 8773(J), 13238(J)

Chronographs

development and calibration for study of cosmic radiation, 11: 521

Circuits

(See also Coincidence circuits; Coupling circuits; Differentiating circuits; Feedback systems; Quenching circuits; Timing circuits.)

design for measurement of electric properties of ceramics, 11: 11297

design for reduction of time jitter in output of single channel analyzer, 11: 4542

design for 256-channel pulse-height analyzer, 11: 1561

design for use in scalers for high-energy accelerators, 11: 5967(J)

design of a gain-control type, 11: 11554(P)

design of count integrating, 11: 4536

design of discriminator, with stable discriminator level, 11: 9550(P)

design of drive, for decade glow transfer counter tubes, 11: 3930(J)

design of high impedance, for coupling to low impedances, 11: 11531(P)

design of high-speed trigger for millimicrosecond work, 11: 11541(P)

design of millimicrosecond time analyzer, 11: 3471(J)

design of pulse-shaping, for electronic counters, 11: 9553(P)

design of relay scale-of-two, 11: 10148

design of voltage discriminator, trigger-type, 11: 9552(P)

development of simplified, for ultrasonic inspection, 11: 9372

gating, design using two vacuum tubes and two crystal diodes, 11: 7028(P)

gating, for low voltage pulses, 11: 5108(P)

low impedance, for retarding potential measurements, 11: 1920(R)

millimicrosecond pulse-shaping, 11: 12120(J)

multistable electronic, dc design of reliable, 11: 6434

nine-channel time analyzer, for measuring short half-life activities, 11: 1222

printed, flexible laminates for, 11: 10107

printed, properties of Cu-clad plastic laminates for etched boards for, 11: 13360

pulse-height spectrometer, 11: 9373(J)

pulse scaling, 11: 8255(P)

pulser, for magnetizing ferromagnetic devices, 11: 12108

quench and pulse adding for cosmic radiation measurements, 11: 8954(J)

radiation effects, 11: 8215

random interchange of, with applications to counting rate meters, and function generators, 11: 12146(J)

Circuits (cont'd)

resistance analog device for studying axially symmetric magnetic fields, 11: 5409

stabilized photomultiplier tube, 11: 11544(P)

theory, 11: 13358(R)

transistor, for nuclear instruments, 11: 2961

Circulating fuel reactors

See Aircraft reactors; Fluid fuel reactors; Homogeneous reactors.

Circulating moderator reactors

See Aircraft reactors; Homogeneous reactors.

Citric acid

eluting agent in rare-earth separation by ion exchange, 11: 195(J)

Citrulline

labeled with C^{14}, biosynthesis by blue-green algae, 11: 1491

Civilian defense

(See also Radiological defense; Radiological warfare.)

against radiation injuries, 11: 8764

effects of nuclear explosion on petroleum gas installations and facilities, 11: 9905

measures in nuclear weapon attack, 11: 9205(J)

radioactivity induced in food exposed during atomic explosion, 11: 1752

radiological telemetering systems for fall-out monitoring, performance, 11: 11039

shelter evaluation, 11: 7922

shelter system specifications, 11: 4218

training programs during Operation Teapot, 11: 1750, 1751

wholesomeness of canned foods following nuclear explosion, 11: 7070

Clays

(See also Bentonites; Florida leached zone material; Montmorillonites.)

adsorption of fission products by, 11: 1026, 1489, 1497

Cleaning solutions

(See also Decontaminating solutions; detergents.)

corrosive effects on stainless steel, 11: 12733

ethylene glycol, for removing Na in Submarine Intermediate Reactor heat transfer system, 11: 2442

Clementine

See Los Alamos Fast Reactor.

Clevite Research Center, Cleveland

progress reports on lubrication of Ti, 11: 2917(R), 8007(R), 11217(R)

Climax Molybdenum Co. of Michigan, Detroit

progress reports on high-temperature alloy development, 11: 5348(R)

Clinch River

radiological monitoring, 11: 8870

Clinton Labs., Oak Ridge, Tenn.

progress reports, 11: 12329(R)

progress reports on bismuth phosphate precipitation, 11: 7515(R), 8363(R)

progress reports on chemistry, 11: 8361(R)

progress reports on engineering development, 11: 8451(R)

progress reports on preparation of radioactive barium-lanthanum, 11: 11733(R)

progress reports on separations procedures, 11: 7518(R)

Clinton Labs., Oak Ridge, Tenn. (cont'd)
progress reports on purification of U^{235} from reactors, 11: 12388(R), 12392(R)
progress reports on research and manpower distribution, 11: 8360(R)
progress reports on the 23 Process, 11: 12393(R)
progress reports on U^{233} separation, 11: 7539(R)
Clinton National Lab., Oak Ridge, Tenn.
progress reports on canning of Th carbonate, 11: 7682(R)
Clinton reactors
For Clinton Enriched Reactor, see Materials Testing Reactor Mockup; for Clinton Graphite Reactor, see ORNL Graphite Reactor; for Clinton Heterogeneous Reactor, see Materials Testing Reactor Mockup; for Clinton Hi-flux Reactor, see Materials Testing Reactor Mockup; for Clinton Homogeneous Reactor, see Homogeneous Reactor Experiment.
Cloth
See Textiles.
Clothing
(See also Protective clothing; Textiles.)
cotton, decontamination, 11: 3303(J)
thermal radiation protection of skin by, mathematical analysis and simulated experiment, 11: 7065
Cloud chambers
(See also Cloud-ion chambers.)
design, 11: 1604(J), 3890, 4574(J), 4936
design and material studies, 11: 12330(R)
design and operation of high-pressure, 11: 8099(J)
design of self-operated, 11: 6832(J)
diffusion, for the experimental determination of neutron half life, 11: 9399
diffusion, survey of development, 11: 12152(J)
high pressure expansion-diffusion, 11: 9024(J)
momenta of high-energy charged particles measured in diffusion, 11: 6476(J)
multiple scattering measurements and distortion effects in high-pressure, 11: 4580(J)
operation for meson research at the Cosmotron, 11: 1542(R)
operation of fast cycling, 11: 3003(J)
operation of high pressure Wilson, 11: 12814(J)
operation of multiplate, 11: 3003(J)
operation with 23 atm. of deuterium, 11: 4575(J)
Cloud-ion chambers
conference on, 11: 13395(J)
Clouds
(See also Atomic clouds.)
charge accumulation in thunder-, 11: 7232(J)
particle size measurement and distribution, 11: 2615, 11077
Coal deposits (U.S.)
bibliography of the geology of U-bearing, 11: 11189
Coatings
(See also specific coatings; see also coatings named by method of application, e.g., Dip coatings; see also Carbide coatings; Ceramic coatings; Metal coatings; Oxide coatings; Paints; Plastic coatings; Refractory coatings; Silicone coatings; Slug coatings.)
development and testing, 11: 8450(R)
Coatings (cont'd)
heat radiation and emissivity measurements, 11: 3797
protective, for Mo, preparation and testing equipment, 11: 3401(J), 8009, 12749
protective water resisting, radiation damage, 11: 13725
radiation damage, 11: 1374
radiation effects on polyester resin Liquid Tile, 11: 11960
testing equipment, heat and corrosion resistant, 11: 3386(R)
vacuum deposition, design of holder for spheres and cylinders for, 11: 12455
Coaxial cables
construction of pulse guide, 11: 3912
square wave transmission testing, 11: 2579
Cobalt
chromatographic adsorption on Al_2O_3 from mixtures of $LiNO_3-KNO_3$, 11: 4377(J)
corrosion following irradiation, 11: 12963(R)
degassing before irradiation, 11: 3203
determination in Al–Co–Mn alloys, 11: 8296(R)
determination in homogeneous reactor solutions, 11: 4292(J)
diffusion in alloys, tracer studies, 11: 210(J)
diffusion in Co–Al alloys, 11: 6397(J)
gamma reactions (γ,n), 11: 704(J)
influence on boron spectrum at 2496A, 11: 2198(J)
internal defects and crystal structure of hexagonal, 11: 12093(R)
ion exchange behavior on Dowex-50, 11: 5276(J)
ionization potential difference and variable valence, 11: 11071(J)
neutron activation determination, 11: 12973(R)
neutron reactions, 11: 10554
neutron total cross sections from 3.8 to 8.1 Mev, 11: 4046(J)
nuclear spallation by 170-Mev protons, 11: 6545
oxidation and adsorption of O_2 on, 11: 11918
photonuclear reactions, ratio of deuterons to protons in, 11: 4118(J)
precipitation-separation from Ni using $Ni(OH)_2$, 11: 6584(P)
radiation effects, 11: 1922(R)
radiometric determination in water, 11: 8870
separation from nickel, 11: 7387(P)
separation from Ni by solvent extraction with di(2-ethylhexyl) phosphoric acid, 11: 10036(R)
solvent extraction from thiocyanate solutions, 11: 6237(R)
x-ray diffraction, effects of strain, particle size, and stacking faults on, 11: 12093(R)
Cobalt alloy–stainless steel couples
corrosion, 11: 13985(R)
Cobalt alloys
corrosion, 11: 11682(R), 12585(R), 13985(R)
corrosion and wear, data for water-cooled reactors, 11: 12028
corrosion by high temperature high purity H_2O, 11: 2903(J), 2904(J)
corrosion by HNO_3 of Stellite-6, 11: 12898(R)
corrosion by UO_2SO_4, 11: 9869(R)
corrosion in high-purity water, 11: 12035(J)
corrosion in Redox Process streams, 11: 8454

Cobalt alloys (cont'd)

corrosion in Thorex solutions, 11: 7487

corrosion of Stellite in decontaminating solutions, 11: 8708(R)

corrosion product removal by $CrSO_4-H_2SO_4$, 11: 11680, 11681

creep and rupture stresses at high temperatures for jet applications, 11: 307

high-temperature properties, development and improvement, 11: 1139(R), 3851(R), 4095(R), 5326(R)

mechanical properties of Stellite-3 and -6, 11: 11707

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

radiation effects on hardness, 11: 13868(R)

specific heat of Stellite 21, 11: 6382(R)

Cobalt–aluminum alloys
See Aluminum–cobalt alloys.

Cobalt–aluminum–manganese alloys
See Aluminum–cobalt–manganese alloys.

Cobalt–aluminum oxide systems
See Aluminum oxide–cobalt systems.

Cobalt bromides

reactions with $LiBH_4$ and $LiAlH_4$, 11: 915(J)

free energy of formation, 11: 86(J)

Cobalt chlorides

adsorption from organic solvents on anion exchange resins, 11: 9578(R)

antiferromagnetic structure of anhydrous, 11: 9189(R)

free energy of formation, 11: 86(J)

Cobalt(II) chlorides

heat of solution, 11: 11563(R)

neutron scattering, 11: 4016(R)

Cobalt–chromium alloys
See Chromium–cobalt alloys.

Cobalt–chromium–iron–nickel alloys
See Chromium–cobalt–iron–nickel alloys.

Cobalt–chromium–nickel alloys
See Chromium–cobalt–nickel alloys.

Cobalt complexes

with EDTA, charge transfer rates between Co^{2+} and Co^{3+}, 11: 916(J)

isotopic chemical effects on reversible oxygenation, 11: 4814(R)

with nitrosonaphthol, formation constants, 11: 4301(J)

phthalocyanine and hydroxyethylamine, polymerization, 11: 106

radiation damage in Szilard-Chalmers reaction, kinetics of isothermal annealing, 11: 13550(J)

Cobalt compounds

absorption on orthophosphate and phosphonate polymers, 11: 4373

formation and high-temperature properties of $CoO \cdot BeO$, 11: 4428(J)

Cobalt ferrites

heat treatment in magnetic fields, neutron diffraction study, 11: 3392(J)

Cobalt films

magnetic domain patterns on thin, 11: 7203(J)

Cobalt fluorides

crystal structure of CoF_3, 11: 3711(J)

nuclear magnetic resonance of F^{19} in, 11: 6881(J), 6882(J)

Cobalt iodides

free energy of formation and heat of solution, 11: 86(J)

Cobalt ions

reactions with Ce^{3+} in $HClO_4$ solution, 11: 175(J)

Cobalt–iron–nickel alloys

pressure test of thermocouple insert seal weld of, to stainless steel, 11: 1880

radiation effects, 11: 8747(R)

Cobalt isotopes

formation during irradiation of stainless steel, 11: 10554

Cobalt isotopes Co^{56}

gamma radiation, 11: 3044(J), 3209(J)

Cobalt isotopes Co^{57}

conversion electrons, study with double focalization spectrometer, 11: 10608(J)

decay schemes, 11: 1542(R), 2194(J), 5179(R), 9186(R)

K-Auger electrons and conversion electrons, 11: 6966(J)

Cobalt isotopes Co^{58}

beta decay of polarized nuclei, 11: 10264(J)

beta emission asymmetry, 11: 10687(R)

gamma radiation, 11: 3044(J)

half life, 11: 1292(J)

nuclear alignment methods applied to study of nuclear properties, 11: 1297(J)

positron emission by polarized, asymmetry, 11: 6034(J)

Cobalt isotopes Co^{59}

energy levels, 11: 12186(R)

excited states, 11: 11368(J)

$neon^{20}$ reactions, products from, 11: 4123(J)

neutron cross sections, 11: 11740(R)

neutron total cross sections and resonances in kev region, 11: 6065(J)

proton reactions (p,n), 11: 4710(J), 10323(J)

thermal neutron capture by, soft γ rays from, 11: 10757(J)

Cobalt isotopes Co^{60}

angular correlations in the two-photon Compton effect, 11: 10349(J)

beta decay, circular polarization of γ rays, 11: 8154(J), 13485(J)

beta decay, longitudinal polarization of, 11: 9459(J)

beta spectra, 11: 772(J), 4971(J)

correlation coefficients, 11: 10266(J)

cross-over transition from 2.5-Mev state to ground state, 11: 4372(J)

dosage measurements, 11: 6474(J), 11321

electrons, parity and polarization, 11: 7235(J)

energy levels from proton scattering data, 11: 9186(R)

gamma emission from, detection and measurement, 11: 4059(J), 6027(J), 9398, 10395, 10586, 10648, 11329, 12285

gamma source design, 11: 59(J), 60(J), 1700(J), 3616(J), 5981(J), 6625(J), 10588, 10625(J), 11311(J)

half life, 11: 1567(J), 6054(J), 9587(R)

momentum dependence of asymmetry parameter, 11: 10264(J)

production in power reactors for radiation sources, 11: 1377

shielding requirements for 10-c γ source, 11: 790(J)

separation from aqueous waste solutions, 11: 5828

Cobalt isotopes Co^{60} (cont'd)

therapeutic application for eye tumors, 11: 6622(J)

therapeutic applications in teletherapy machine, 11: 13251(J)

uptake and tissue distribution in clams, 11: 3675, 6228(J)

Cobalt–lithium alloys

reactor criticality effects, 11: 10727

Cobalt–magnesium alloys

neutron-diffraction analysis, 11: 9054(R)

Cobalt–manganese alloys

neutron-diffraction analysis, 11: 9054(R)

Cobalt–nickel alloys

substructure and correlation to tensile property, study of, 11: 1536

Cobalt nitrates

heats of solution in organic solvents, 11: 9578(R)

Cobalt oxides

magnetic hysteresis shift of, 11: 12738

standard free energy of formation, 11: 6236

Cobalt–platinum alloys

order and atomic size in, x-ray determination, 11: 1130

Cobalt sulfides

oxidation at elevated temperatures, 11: 1766(J)

Cobalt thiocyanate complexes

solvent extraction, 11: 3784

Cobalt–titanium alloys

high-temperature properties for aircraft gas turbines, 11: 5326(R)

Cobalt–tungsten carbide systems

wear resistance of journal bearings of, in Na and NaK, 11: 2448

Cockcroft-Walton accelerators

beam analyzer design, 11: 5402

design, 11: 590(J), 5634(J)

radio-frequency ion source design, 11: 1360(J)

Coffinites

occurrence in Fall River Formation, Wyo. 11: 4862

Coincidence circuits
(Circuits peculiar to specific instruments are indexed with the instruments.)

design, 11: 495(J), 1586(J), 2600, 3496(J), 5109(P), 5459(J), 6447(J), 6456

design of dual, for very short resolving times, 11: 9549(P)

design with time sorter, 11: 10657(J)

millimicrosecond, limitations and methods of improving, 11: 1982

short lifetimes measured by fast, 11: 1254(J)

Coincidence counters

design, 11: 491(J), 1595(J), 2987(J), 5961, 6494(R)

Coincidence measurements

techniques and theory of fast, 11: 6482(J)

techniques for cyclotron experiments, 11: 6467

Coke

chlorination, 11: 153(R), 154(R), 155(R), 156(R), 157(R), 158(R), 159(R)

graphitization, effect of purity on, 11: 13617

petroleum, production and purification, 11: 1795(R)

Cold valves

design and performance for flow control of cold fluids, 11: 12110

Collagen

microscopy, sample preparation, 11: 6192(J)

Collimators

design considerations for biological scintiscanning, 11: 1593(J)

fabrication of 1 μ holes for α-particle microbeams, 11: 4549(J)

gamma-ray, for use with 340-Mev electron synchrotron, 11: 8096(J)

for neutron crystal spectrometer, high resolution Soller slit, 11: 14037

Colloids

(See also Aerosols; Disperse systems; Drops; Gold (colloidal); Silicon oxides (colloidal); Smokes.)

dielectric constants of solutions, 11: 13258(J)

in electrodeposition processes, ultramicroscopic observations, 11: 341(J)

light scattering by, bibliography, 11: 6761(J)

radiation effects on reaction mechanisms in, 11: 13282

radioactive, tissue distribution, design of instrument for determination, 11: 9974(J)

of radioactive gold, preparation, 11: 13261(J)

tissue distribution, 11: 13565(R)

Colorado

uranium deposits, 11: 5317, 6356(R)

Colorado (Gilpin Co.)

geology of Wood and East Calhoun Mines of the Central City District in, 11: 12045(J)

paragenesis and structure of pitchblende-bearing veins in Central City District in, 11: 3826(J)

Colorado (Jefferson Co.)

pitchblende deposits in Golden Gate canyon area in, 11: 1118(J)

Colorado (Mesa Co.)

preliminary geologic map of western part of Gateway District, 11: 10544(J)

Colorado (Montezumo Co.)

preliminary geologic map of Sentinel Peak NW Quadrangle in, 11: 12040(J)

Colorado (Montrose Co.)

occurrence of duttonite in Peanut Mine in, 11: 13328(J)

photogeologic map of Mount Peale-8 Quadrangle in, 11: 1092(J)

preliminary geologic map of Mount Peale 1 SE Quandrangle in, 11: 10545(J)

Colorado Plateau (Colo.)

geology, 11: 4442(J)

index map showing location of mapping projects, 11: 10084(R)

uranium-V sandstone deposits, 11: 7996(J)

Colorado (San Miguel Co.)

photogeologic map of Mount Peale-16 Quadrangle in, 11: 1093(J)

Colorado School of Mines Research Foundation, Inc., Golden

progress reports on U recovery from ore and concentrate samples, 11: 7191(R), 8871(R), 10478(R), 10479(R)

Colorimeters

cell corrections, 11: 937(J)

Colorimetry

corrections for cell length and absorbance in, 11: 937(J)

principles for increasing analytical accuracy, application to, 11: 8841(J)

Columbia River

radiobiological-ecological monitoring, 11: 6261(R), 8257(R), 8260, 11556(R), 13569

radiological monitoring, 11: 1498, 1747, 1748(R), 2242(R), 3297(R) 9202(R), 11666

travel time between reactor effluent discharge points and city water plant intakes, measurement, 11: 49

turbulent diffusion of heat and suspended material in, mathematical analysis, 11: 7160

Columbia Univ., New York

progress reports, 11: 12177(R)

progress reports on flocculating agents for phosphate slimes, 11: 2815(R)

progress reports on isotope separation, 11: 1229(R)

progress reports on size separation of aerosol particles, 11: 8037(R)

Columbia Univ., New York, Columbia Radiation Lab.

progress reports, 11: 4489(R)

progress reports on the electromagnetic spectrum, 11: 1383(R)

Columbia Univ., New York. Mineral Beneficiation Lab.

progress reports on recovery of U from Chattanooga shale, 11: 7145(R)

Columbia Univ., New York. Nuclear Physics Labs.

progress reports, 11: 551(R), 1273(R), 1274(R), 7292(R), 10232(R), 10686(R), 10687(R)

Columbia Univ., New York. Radiological Research Lab.

progress reports on radiobiology and radiological physics, 11: 3479(R)

Columbium
See Niobium.

Column packing

properties of monel Stedman-type, 11: 12354

Combustion

chamber design for carbon, 11: 11540(P)

Comet Mine (Mont.)

mineralogy and geology, 11: 2908(J)

Communication theory

analysis of statistical, 11: 1920(R), 5369(R)

statistical, 11: 13358(R)

Compacts

(See also specific compacts and kinds of compacts, e.g., Boride compacts.)

elastic and thermoelastic properties, 11: 3881(J)

Complexes
See Benzene, nitro- complexes; Chelate complexes; Cupferron complexes; Hydroaromatic complexes; Iodate complexes; Metal complexes; Picric acid complexes; and other specific complexes.

Compounds
Specific compounds are named, and indexed, according to precedents found in such standard reference works as Chemical Abstracts and the Handbook of Chemistry and Physics. See classes of compounds identified by the element of interest, e.g., Uranium compounds. See classes of compounds by type, e.g., Acids; Alcohols; Salts; Addition compounds; Intermetallic compounds.

Compressible flow

(See also Incompressible flow.)

average quantities in nonuniform stream, analysis, 11: 1037

friction effects on, in vaneless diffusor space of centrifugal compressors, 11: 4410

mathematical functions, graphical solution, 11: 2890

Compressible flow (cont'd)

one-dimensional, in electrolytes, 11: 2424

pressure-temperature relation for constant-area compressible flow of gas, 11: 10516

Compressors

(See also Blowers; Pumps.)

flow in vaneless diffuser space of centrifugal, friction effects, 11: 4410

hydraulic superpressure, design, 11: 2967(J)

for pressures up to 3,000 psi, lab-type, 11: 4838(J)

Compton effect

angular distribution of electrons, 11: 8964(J)

characteristics at high energies, 11: 1950(J)

interference in the double, 11: 9153(J)

Computers

(See also Cybernetics; Delay lines; Magnetic recording systems; Mathematics; Memory devices; Mercury delay lines; Reactor simulators.)

analog, application, advantages, and limitations of, 11: 6809(J)

analog, application to boiler-reactor interaction problem, 11: 6812(J)

analog, operation and control, 11: 6808(J), 11740(R)

analog, programming of reactor model, 11: 13110

analog, use as reactor simulator, 11: 6810(J)

analog, user organizations tabulation, 11: 6813(J)

analog and digital, comparison, 11: 6805(J), 7262(J)

analysis of pion scattering by the maximum likelihood method, 11: 9154(J)

applied mathematics, problems arising in computer use, 11: 479(R)

automatic, for transposed functions, 11: 8256(P)

coding, discrete noiseless, 11: 8025(R)

coding, subroutine index, 11: 1235

coding, TOPSY operating instructions, 11: 13385

coding, usefulness of Monte Carlo method, 11: 6806(J)

coding, usefulness of Monte Carlo method for neutron behavior, 11: 3475

coding and compression of codes, 11: 9393(J)

coding and programming, 11: 1234

coding CIRCLE, 11: 2594

coding for molecular orbital calculations, 11: 10226

coding for one-dimensional, one-group transport theory routine, 11: 4930

coding for solution of Wigner-Wilkins equation for neutron spectra in hydrogen, 11: 14025

coding for thermal stress calculations in cylinders with internal heat generation, 11: 10641

coding heat transfer calculations using lumped metal heat capacity, 11: 13718

coding IBM-650, 11: 1321, 1575, 5428, 5431, 5432

a coding IBM-650, for flux data processing, 11: 12806

coding IBM-650, for flux distribution in slabs and cylinders, 11: 6802

coding IBM-650, for steady-state two-group equation for slab geometry with fast and thermal fission, 11: 10634

coding IBM-704, 11: 3945, 6463

coding IBM-704 for reactor thermal transients, 11: 9391

coding IBM-704, generalized two-space-dimension multigroup, 11: 8081

Computers (cont'd)

coding IBM-704, one dimensional few-group depletion, 11: 10640

coding IBM-704 to invert the Fourier cosine transform, 11: 7259

coding of Beehive and Hornet for spherical geometries, 11: 8177

coding of Chalk River Datatron, 11: 1231

coding of digital, for analysis of nuclear particle tracks, 11: 11325

coding of digital, for processing neutron cross section data, 11: 6459

coding of ORACLE, 11: 1618(R), 4016(R), 5647, 6457

coding reactor control rod scram motion, 11: 13946

coding specifications of Program George, 11: 10162

coding UNIVAC, 11: 1978, 4543, 6801

coding UNIVAC for inelastic scattering integrals, 11: 11460

design, 11: 8558

design and construction of slide rule for computing solid angles, 11: 12803

design and operation, book, 11: 6465

design and operation for predicting radioactive fall-out, 11: 4547(J), 8074

design and research, 11: 459, 476(R), 477(R)

design characteristics, engineering features, and programming characteristics of electronic digital computing systems, 11: 10635

design features of Maniac II, 11: 3944

design of analog for convective heating problems, 11: 9388

design of electrical analogue for studying thermal stresses in Hanford waste tanks, 11: 6698

design of input-output unit for, 11: 9395(J)

design of logic circuits employing feedback, 11: 9383

design of 256-channel digital, for pulse-height analysis, 11: 1561

design of 1024-channel, for neutron time-of-flight analysis, 11: 1597(J)

design of passive digital translator, 11: 8073

design of rotating capacitor as function generator for, 11: 8071

development of components, 11: 455, 1278(R), 3264(P), 3641(P)

digital, arrangement and organization of, 11: 6803(J)

digital, code classification, economics, and availability, 11: 6804(J)

digital, table of user organizations, 11: 6807(J)

digital techniques applied to analysis of atomic spectra, 11: 2199(J)

digital techniques applied to reactor control systems, 11: 10163, 10165

function generators, circuits for, 11: 12146(J)

Hill equation resonance studies, 11: 10637

high speed, study program on, 11: 10160(R), 10161(R)

mathematical symbols for electronic, 11: 9392(J)

operating instructions for a modification of the Eyewash program, 11: 9385

operating instructions for Nupak, for neutron angular flux computing, 11: 1233

operation and programming, 11: 1235

Oracle, operation, 11: 9387(R)

problems on passive analog, methods for setting up, 11: 2595

programmer's guide to Chalk River Datatron, 11: 1231

programming, 11: 11736

programming, use of floating point arithmetic, 11: 1976

Computers (cont'd)

programming and coding for foil activation experiments, 11: 13850

programming and coding to test pseudo-random numbers, 11: 2590

programming for analyzer of r-f mass spectrometer, 11: 1571

programming for approximations to circular normal distribution, 11: 2588

programming for calculating particle motion for FFAG accelerator, 11: 716

programming for calculating total cross section from crystal spectrometer data, 11: 8080

programming for energy distribution in infinite medium, 11: 1270

programming for measurement of absorption correction in single crystal diffraction, 11: 5930(J)

programming for Monte Carlo method, 11: 8993(J)

programming for multigroup nuclear reactor calculations in three-space dimensions, 11: 1325

programming for multigroup reactor calculations, 11: 12853

programming for neutron energy distribution in infinite medium, 11: 1269

programming for one-dimensional transport theory, 11: 3551

programming for parameter calculations of low pressure gas liquefaction cycles, 11: 13374

programming inverse functions, 11: 10167(J)

programming of, for problem of heavy water production, 11: 10009(J)

programming of automatic, by simple compiler techniques, 11: 7261(J)

programming of IBM-650 for, polynomial fit by least squares, 11: 1977

programming of IBM-650 for processing activation analysis data, 11: 10536

programming of IBM-650, for processing data on neutron energy spectra distribution in homogeneous water moderated reactor, 11: 12884

programming of IBM-650, for one-to-eight group code, 11: 1575

programming of IBM-701 for processing complicated thermodynamic equilibria data, 11: 6799

programming of IBM-704 for, one-dimensional few group diffusion equation code, 11: 4102

programming of UNIVAC, for solution of one-dimensional multigroup reactor equations, 11: 1314

programming the least-squares fitting of atomic-beam resonance curves, 11: 9390

programming two-energy-group analysis for a cylindrical reactor core with a ring of N control rods, 11: 10164

programming two group diffusion equations of cylindrical reactors, 11: 9384

SOFOCATE code for, for neutron diffusion calculations, 11: 13510

system for simultaneous memory recall, 11: 12805

UNIVAC Topsy code, 11: 12804

for uses as analyzer of r-f mass spectrometer, description, 11: 1571

uses in process control, review, 11: 5433(J)

Concrete aggregates

chemical and physical properties, 11: 2764

shielding properties, 11: 2765, 3213, 13219

testing of concrete with magnetite–limonite, 11: 2418

Concretes

(See also Cements; Concrete aggregates; Reactor materials; Shielding materials; Barite concretes.)

chemical and physical properties, 11: 2764

compression tests, 11: 11747(R)

Concretes (cont'd)

compressive strength, 11: 4664(R)

engineering properties of high-density, 11: 9892

iron-aggregate, increasing bulk density of, 11: 8473

neutron reactions (n,γ), 11: 13209

physical properties of high-density limonite and/or magnetite, 11: 2418

radiation attenuation characteristics, 11: 1618(R), 2761, 7847(R), 10365

radiation effects, 11: 8747(R)

radioinduced heating, 11: 12581

shielding properties, 11: 9173(J), 12300(J), 12942(J), 13597(R), 13883(R)

shock wave transmission, 11: 5004

stress distribution in cylindrical, reactor shield, 11: 2763

temperature distribution in cylindrical, reactor shield, 11: 2763

temperature gradients through shielding, analog study, 11: 13215

thermal neutron diffusion length, 11: 789

thermal stresses in reinforced slabs, 11: 13554

use in radium sludge storage towers, 11: 2413

Condensers

absorption of reactor heat in turbine out or part load at Calder Hall, 11: 665(J)

design, for H water vapor mixtures, 11: 12014(J)

design and construction of fluidized, 11: 2248

design and testing for Redox Process, effect of secondary steam production, 11: 3381

design for Homogeneous Reactor Test chemical processing plant, 11: 10933

design specifications and calculations for Materials Testing Reactor dissolver, 11: 8337

dissolver reflux, for Th slugs, 11: 7411

heat and mass transfer in cooler, 11: 6707(J)

heat removal rate from Homogeneous Reactor Test fuel reflux, 11: 9797, 9799

heat transfer coefficients, 11: 13579(R)

performance of fluidized, for UF_6 recovery, 11: 12709(J)

recombiner, for Homogeneous Reactor Test, 11: 13137

surface area and pressure drop in bayonet tube reflux in Homogeneous Reactor Test, effect of cooling water flow velocity, 11: 2655

test procedures for Homogeneous Reactor Test, 11: 8646, 10936, 10937

testing as trap of sodium aerosols, 11: 3885

tube corrosion, 11: 10960

Conductors
See Semiconductors; Superconductors.

Connecticut. Univ., Hartford

progress reports on packaging materials, 11: 1414(R)

Connecticut Hard Rubber Co., New Haven

progress reports on high temperature structural adhesives, 11: 5853(R)

Connective tissue

composition and structure of elastic tissue, electron microscope and x-ray study, 11: 6192(J)

radiation effects on mast cells in rat mesentery, 11: 838(J)

secretive activity of mast cells, 11: 12642(R)

Connectors (electric)

(See also Cables; Disconnects; Electric power.)

Connectors (electric) (cont'd)

solderless, environmental testing, 11: 10616

Constants and conversion factors

(See also Atomic constants; Danger coefficients; Dielectric constants, Multiplication factor; Virial coefficients.)

angular distribution data, tables for transformation from laboratory system to center-of-mass system, 11: 9386

for computing radiation dosage, 11: 11902(J)

error function, ϕ, new shorter method for use in conduction, diffusion, and neutron reactor physics, 11: 2592

vector-addition coefficients for $j_2 = 5/2$, algebraic tables, 11: 10644(J)

Constitution diagrams

(See also Phase studies.)

index to recently reported, 11: 4497(J)

Contamination

(See also Radioactive contamination.)

control, design of barrier panels for, 11: 7960

Control
See Remote-control equipment; Servomechanisms; Temperature control.

Control elements
See Reactor control elements.

Control rods
See Reactor control rods.

Control systems
See Electric control systems; Reactor control systems.

Convair, Fort Worth, Tex.

progress reports on health physics activities, 11: 6614(R)

Convection

(See also Heat transfer.)

heat transfer review, 11: 5300(J)

of organic, high boiling, heat transfer agent, 11: 6334(J)

Convection (forced)

in circular conduits, annuli, and between parallel plates, mathematical analysis, 11: 1045(J)

flow in open-ended annulus, 11: 2439

Convection (free)

flow studies, 11: 13714

in heat generating fluid, 11: 236

in liquid annuli, calculations, 11: 2435

in reactor cooling system, mathematical analysis, 11: 2729

Conversion electrons

(See also Beta particles; Internal conversion.)

angular correlation of, in cascades with long-lived intermediate state, limitations, 11: 617(J)

from β spectrometer, recording by nuclear emulsions, 11: 1951(J)

Cooling towers

comparison between mechanical and natural draft, 11: 1504

deterioration of redwood, chemical and fungal, 11: 7935

hyperbolic, at Calder Hall, 11: 665(J)

Copper

alpha-particle scattering at 40.2 Mev, 11: 6952(J)

angular correlation for positron annihilation, 11: 10265(J)

Copper (cont'd)
angular distribution of elastically scattered 5.7-Mev protons from, 11: 9446(J)
annealing of cold-worked, by electron irradiation, 11: 4743(J)
annealing of rings by induction heating, 11: 13333
anodic and cathodic polarization in the layer of .01 N solution of NaCl, 11: 6352(J)
antiproton interactions with nuclei, 11: 11362
catalytic effects on gas recombination, 11: 4083, 4671, 11757, 13584
chromatographic adsorption on Al_2O_3 from mixtures of $LiNO_3-KNO_3$, 11: 4377(J)
coating, 11: 13093(R)
contaminated with uranium, hazards and control during handling, 11: 12658(J)
corrosion by anisole–BF_3 system, 11: 6368(R)
corrosion by fluorine gas at high temperatures, 11: 7184
corrosion by tropical environments, 11: 10538
corrosion by water, effects of deuteron irradiation on, 11: 8737
cryogenic data, 11: 386
crystal structure of deuteron irradiated, 11: 10779
decontamination by fire refining, 11: 9733
determination in homogeneous reactor solutions, 11: 4292(J), 10974
determination in U peroxide and black oxide, 11: 1772
deuteron inelastic scattering cross sections at 190 Mev, 11: 8735(R)
deuteron reactions, 11: 4709(J), 5365(R)
deuteron reactions (d,n), 11: 9778
diffusibility of Ag and Au in, 11: 11194(R)
diffusion in Ag, 11: 3425(R)
elastic modulus, electric resistivity, and internal friction, effect of pulse annealing after cold work on, 11: 7693(R)
elastic properties, 11: 343(J)
electrical resistivity change due to electron bombardment below 10°K, 11: 1692(J)
electric resistivity, effect of cold work and irradiation on, 11: 8547(R), 13113(R)
electrodeposition, 11: 9186(R)
electrodeposition from uranyl sulfate solutions, 11: 8296(R)
electrodeposition on Al and stainless steel, 11: 11203
electrodeposition on Be powder from $CuSO_4$ solution, 11: 2526
electrodeposition on Th, 11: 13783
electrodeposition on Th for protection against corrosion, 11: 13773
electrodeposition on Zr cans and Zn dip-coated U, 11: 7673(R)
emissivity and reflectivity, measurement of total normal, 11: 6421
excitation of characteristic K x rays from, by protons, deuterons, and α particles, 11: 12932(J)
explosive reactions with H_2O at high temperatures, 11: 2511
fluorescence yield, 11: 4648(J), 5545(J)
gamma absorption cross sections, 11: 12287(J)
gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856
gamma reactions, 11: 704(J), 4115, 4121(J), 5614(J), 5655(J), 6549(J)
gamma scattering, 11: 6949(J)
Hall coefficient as function of temperature, 11: 8942(R)
heat radiation and emissivity measurements, 11: 3797
Copper (cont'd)
ion exchange behavior on Dowex-50, 11: 5276(J)
low-temperature radiation effects, 11: 9158(J)
mechanical properties and transport theory, radiation effects, 11: 8942(R)
meson(π^-) interactions at 140 to 400 Mev, total cross section for, 11: 12830(J)
meson production in, by cosmic rays, 11: 1939(J)
metabolism in rats, tracer study, 11: 2807
neutron, proton, deuteron, He^3, and α scattering cross sections, 11: 10996(R)
neutron activation determination, 11: 1776, 10286, 12973(R)
neutron capture cross sections, 11: 8116(R)
neutron reactions, 11: 2174(J), 3593(J), 4047(J), 4130(J), 5623(J)
neutron reactions (n,γ), 11: 13209
neutron scattering cross sections, 11: 8562(R), 10910
neutron yields from deuteron, neutron, and proton reactions, 11: 8726
nuclear spallation by 680-Mev protons, 11: 12196(J)
nuclear size studied by cosmic-ray interactions, 11: 6058(J)
nucleon momentum in, from high-energy photoeffect, 11: 3021(J)
oxidation, O^{18} isotope effect, tracer study, 11: 10046(J)
oxidation and adsorption of O_2 on, 11: 11918
permeability to H_2, 11: 13825(R)
photonuclear reactions, ratio of deuterons to protons in, 11: 4118(J)
pion scattering at 78 Mev, 11: 3001(J)
plastic flow, effect of strain and temperature on, 11: 7204(J)
polarographic determination in homogeneous reactor solution, 11: 8285(R)
polarographic determination in Pu-bearing solutions, 11: 12346
powder metallurgy, 11: 10550
proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)
proton reactions (p,pn), excitation functions, 11: 14020(R)
proton reactions at 5.7 Bev, 11: 11448
proton scattering by, 11: 612(J), 2092(J), 5555(J), 6142(J)
qualitative determination in Pt–U alloys, 11: 3341
radiation damage, 11: 1167(J)
radiation effects, 11: 7693(R)
radiation effects, electric conductivity, and hardness, 11: 8747(R)
radiation effects on shear modulus and internal friction, 11: 7888(R)
radioactivity induced in, by reactor irradiation, 11: 13200
radiochemical determination in Homogeneous Reactor Test fuel solution, 11: 12343
reactions with organic solvent N_2O_4 mixtures, 11: 1025(J)
reactor criticality effects in Intermediate Scale Homogeneous Reactor, 11: 11757
secondary electron emissions from solid and liquid, 11: 1954(J)
shear modulus after irradiation, effects of annealing, 11: 7889(R)
shielding properties, 11: 13218
soldering to stainless steel, 11: 12743
solubility in liquid Bi and Pb, 11: 3866(J)
solubility in saturated water, effects of radiation, 11: 2237(R)
solvent partition in acetylacetone, 11: 11123

Copper (cont'd)

spectrophotometric determination in aqueous solutions, 11: 11575

tensile properties at elevated temperatures, effect of grain size on, 11: 6412(J)

tensile properties of rolled green strip, 11: 9749

thermal capacity, measurement of, 11: 4454(R)

thermal properties at high temperatures, 11: 327, 1527(R)

thermal properties of, bibliography, 11: 331

thermodynamic properties, 11: 11218

thermoelectric properties, 11: 7888(R)

transmutation by C, O, and Ne ions, 11: 4122(J)

transmutation by N and O bombardment, 11: 4121(J)

vacancy formation, energy of, 11: 11234(J)

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

welding, application of ultrasonic energy to cold, 11: 11207

wires, cleaning for boiling heat transfer studies, 11: 1122

x-ray emission spectra in Geissler alloy within temperature range of magnetic transformation, 11: 1891(J)

Young's modulus and internal friction measurements following electron irradiation, 11: 2187(J)

Copper (clad)

preparation with Au and Ag by vapor coating, 11: 1122

Copper (liquid)

thermal conductivity and specific heat, measurement at 3000°F, 11: 5891

Copper alloys

low-temperature radiation effects, 11: 9158(J)

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

Copper–aluminum alloys
See Aluminum–copper alloys.

Copper–aluminum–cadmium alloys
See Aluminum–cadmium–copper alloys.

Copper–aluminum oxide systems
See Aluminum oxide–copper systems.

Copper–beryllium alloys
See Beryllium–copper alloys.

Copper–beryllium compacts
See Beryllium–copper compacts.

Copper–boron carbide systems (clad)
See Boron carbide–copper systems (clad).

Copper–boron systems
See Boron–copper systems.

Copper chelates

with 2,4-pentanedione, absorption spectra, 11: 164

Copper chlorides

antiferromagnetic ordering and electron structure of $CuCl_2.2H_2O$, 11: 9990(J)

chronopotentiometric determination in LiCl–KCl systems at 450°C, 11: 2834(J)

heat of formation, 11: 1419(J)

Copper compacts

permeability and porosity of, 11: 10550

sintering of Cu–B powder dispersions and corrosion, 11: 12753

Copper complexes

with acetylacetone, solvent extraction behavior, effects of EDTA on, 11: 3763(J)

with halides, stability in aqueous solutions, 11: 146(J)

with nitrosonaphthol, formation constants, 11: 4301(J)

with tetraphenyl prophine, hyperfine structure of paramagnetic resonance spectrum, 11: 2075(J)

preparation of tetrachlorodicuprate complexes, 11: 9186(R)

spectra, 11: 7091(R)

x-ray absorption edge of Cu^{2+} in, 11: 738(J)

Copper crystals

deformation, low-temperature, 11: 1922(R), 8959(R)

deformation at 300 and 78°K, 11: 2556

low-temperature measurements of Young's modulus and internal friction during irradiation, 11: 9159(J)

radiation effects, 11: 762, 1922(R), 4744(J)

small angle scattering from deformed, 11: 8044(J)

Copper cyanides

crystallographic data for CuCN, 11: 3714(J)

Copper–gallium alloys

eutectoid decomposition of β phase in, 11: 363(J)

Copper–gold alloys

atomic size, 11: 4471(J)

corrosion testing of brazed joints of, 11: 10987(R)

electrical resistivity of variation with short-range order, 11: 368(J)

quasi-chemical theory, agreement with experiment in, 11: 3426

radiation effects, 11: 1922(R)

radiation effects on ordering-disordering rates in, 11: 7693(R)

radioinduced disordering rates, 11: 7888(R)

residual resistivity of, short-range order effect, 11: 369(J)

testing as pump bearings, 11: 2891

Copper–iron alloy–nickel alloy couples

corrosion, 11: 13985(R)

Copper–iron alloys

isothermal precipitation of Fe from, kinetics of, 11: 1149(J)

precipitation-hardening, effect of radiation damage on, 11: 5886

properties and radiation effects, 11: 10560(R)

radiation effects on precipitation–hardened, 11: 9332(R)

transformation mechanism and radiation damage in, 11: 7693(R)

Copper isotopes

fission products of high-energy spallation of, by 660 Mev protons, 11: 10320(J)

neutron inelastic scattering, 11: 3592

Copper isotopes Cu^{63}

electrodisintegration, 11: 6111(J)

hyperfine structure, 11: 4640(J)

neutron cross sections, 11: 11740(R)

neutron reactions (n,2n), cross sections, 11: 9140(J)

neutron total cross sections and resonances in kev region, 11: 6065(J)

oxygen^{18} reactions, products from, 11: 4123(J)

Copper isotopes Cu^{64}

beta spectra, calorimetric determination of energy, 11: 12940(J)

separation of trace amounts from reactor effluent water, 11: 11121

Copper isotopes Cu^{65}

hyperfine structure, 11: 4640(J)

neutron total cross sections and resonances in kev region, 11: 6065(J)

proton reactions (p,n), Q value, 11: 699(J)

proton reactions (p,n), study by conversion electrons, 11: 12909(J)

Copper–magnesium alloys

bonding of, to Al, 11: 13794(R)

Copper–magnesium coatings

permeability tests in Pb–2% Sn alloy at 190°C, 11: 7660(R)

Copper–manganese alloys

magnetic structures, 11: 3870(J)

Copper–molybdenum–silicon systems

oxidation and impact properties, 11: 3412(R)

properties, 11: 1119(R)

Copper–nickel alloy couples

corrosion, 11: 13985(R)

Copper–nickel alloy–iron couples

corrosion, 11: 13985(R)

Copper–nickel alloys

diffusion coefficients, 11: 6402(J)

heat transfer rates of tubes, 11: 11161

tensile properties, effect of high temperature and cold drawing on, 11: 6412(J)

magnetic susceptibility, measurement, 11: 8920

Copper–nickel–silicon systems

corrosion resistance, mechanical properties, and metallurgy, 11: 13325(J)

Copper oxide films

formation, O^{18} isotope effect, tracer study, 11: 10046(J)

reduction by atomic H, 11: 7936(J)

Copper oxides

electron scattering, 11: 441(J)

radiation effects, 11: 8747(R)

sintering, effect of O pressure on, 11: 6390(R)

energy of formation, 11: 6236

Copper phthalocyanine

polymerization, 11: 106

radiation effects on, 11: 12697(J)

Copper powders

rolling, 11: 9749

sintering of, 11: 10550

Copper selenides

resistivity, 11: 4632(R)

Copper–silver alloys (liquid)

enthalpy of formation, determination, 11: 3427(R)

Copper sulfate–sulfuric acid–uranyl sulfate systems

corrosive effects, 11: 9287, 10529, 12460, 12461, 12465(R)

Copper sulfate–uranyl sulfate–water systems

phase studies, 11: 4692(R), 6536(R), 8707(R)

Copper sulfates

catalytic effects on recombination of H_2 and O_2, 11: 9587(R)

solubility, 11: 12584(R)

Copper sulfides

electrical conductivity vs. sulfur activity, 11: 3424(R)

oxidation at elevated temperatures, 11: 1766(J)

Copper sulfides (liquid)

electric conductivity at 1300°C, 11: 3441(R)

Copper–tin alloys

polarographic analysis for Sn, 11: 8296(R)

Copper–titanium alloys

phase studies, 11: 4468

Copper–uranium alloys

fabrication of spherical particles, 11: 7689, 13785

Copper–uranium(IV) oxide compacts

thermal conductivity, 11: 9844(R)

Copper uranyl phosphates

preparation, 11: 9583

Cork

physical properties, effects of radiation on, 11: 12691

Cornell Aeronautical Lab., Inc., Buffalo

progress reports on metallurgy, 11: 1136(R)

progress reports on response of aircraft material to stress and heating, 11: 11220(R)

progress reports on Ti and Ti alloys, stress relief procedures, 11: 328(R)

Corral Creek Placer Area (Idaho)

exploration, geology, and mineralogy, 11: 3823

Corrosion

(See also Electrochemical corrosion; High-temperature corrosion; Stress corrosion.)

analytical procedure for elements indicative of, 11: 8677(R)

bibliographies, 11: 3817(J)

bibliography on pitting in ferrous sytems, 11: 11186

of carbon steel by hot water, 11: 269

by chlorine, bibliography, 11: 280(J)

crevice, galvanic, intergranular, and stress engineering problems in high-purity water, 11: 2904(J)

design of loops for fuel testing of, 11: 7858(R)

design of loops for testing in-pile, 11: 8708(R)

effect of dissolved oxygen and acid in Homogeneous Reactor Test, 11: 109

equipment for testing, of heat exchanger materials, 11: 12730(R)

equipment for testing Na–Zr, 11: 8687(R)

experimental procedure and equipment for study in Materials Testing Reactor mockup, 11: 10530

hydrolytic and ion pair adsorption processes, 11: 3766

inhibition in stainless steel by Graphitar, 11: 7606

inhibition studies, 11: 11746(R)

Corrosion (cont'd)

manual for water-cooled reactors, 11: 12028

measurement by hydrogen effusion method, 11: 10537

measurement of Al, 11: 6350

measurement using thin iron films as indicators, 11: 5861

of metals by water at 600°F, studies by a H diffusion method, 11: 6722(J)

oxidation of metals and alloys, review, 11: 5358(J)

pitting anodic, of fuel element mockups, 11: 3815

by Purex-Process acid, uranium, and waste solutions, 11: 271

radiation effects, 11: 9863(R), 10292

radiation effects and potentiometric studies, 11: 11801(R)

radiation effects on rates of, in reactor tubes, 11: 7741

reaction mechanism, 11: 12731

of reactor materials by high-purity water, 11: 2905(J)

in reactors by high temperature water, 11: 12029(J), 12907(J)

sample data and fabrication in Homogeneous Reactor Test heat exchanger, 11: 11683

of stainless steel waste lines, 11: 2478, 2479

static and dynamic, in liquid metal systems, 11: 7186(J)

testing facilities for dynamic and static, 11: 7727

testing of Zr, Zircaloy, and Hf, 11: 1073

testing of Zyglo for metal pitting, 11: 3397

visual inspection of, apparatus for, 11: 8443

by water, radiation effects, 11: 8737

Corrosion conferences

on high-purity water corrosion held by the ASTM at Atlantic City, N. J., 1955, 11: 12035(J)

Plansee proceedings in 1955, 11: 7995(J)

Corrosion films

bibliography on, 11: 12031(J)

deposition in carbon steel loop, radiation effects, 11: 11187

deposition on reactor fuel elements, prevention, 11: 9783

formation on Al in high-temperature water, 11: 11684

infrared transmission spectrum, analysis, 11: 10535

measurement of, in high-temperature high-pressure water coolant systems, 11: 12032(J)

removal from Al, 11: 7991

on stainless steel, removal, 11: 11682(R)

thermal conductivity of Al, 11: 1517

thickness measurements, 11: 11685

Corrosion inhibitors

admixture to oils, tracer study, 11: 279(J)

effectiveness, 11: 8707(R), 11688(R)

effectiveness for stainless steel and Al in water, 11: 13868(R)

effectiveness in protection of U, 11: 7655(R)

effectiveness of, in Pressurized Water Reactor cooling water, 11: 8718(R)

effectiveness of Na_2O_2 in boiler feed water, 11: 13753

effectiveness on stainless steel, 11: 7775(R)

for Homogeneous Reactor Test closed cooling water system and cooling tower water system, 11: 11399

for iron in Dual-Temperature Process, 11: 5101(P)

organic, synthesis, properties, and testing, application to Mg, 11: 5308

Corrosion inhibitors (cont'd)

performance in Pressurized Water Reactor, 11: 8716(R)

performance of, for beryllium, 11: 7680

performance of pertechnetate, perrhenate, and W^{6+} as, 11: 9587(R)

performance of Na chromates as, for C steel in water, 11: 8715(R)

testing and performance of, for Pressurized Water Reactor, 11: 8717(R)

Corrosion loops

analysis of materials from, 11: 268

behavior of Zr in Na, 11: 7848(R)

design, 11: 634, 4900, 6348(R), 7857(R), 13985(R)

design and operation of a 1-in. fused salt, 11: 13316

design and performance of high-velocity, 11: 7644

design for processing Pu producer blanket, 11: 7417(R)

design for the Materials Testing Reactor, 11: 9875

design of liquid metal, 11: 12214(R)

design of liquid-Na, 11: 11745(R)

design of Na, 11: 13503(R)

inspection of Homogeneous Reactor Test, 11: 7859(R)

manometers for flow measurements in, 11: 9828

operation, 11: 1862, 3809(R), 4166, 4692(K), 6536(R), 10532

operation of 100A slurry pump, corrosion studies, 11: 12027(R)

operation of High Performance Reactor in Materials Testing Reactor Mockup, 11: 9289

operation of Homogeneous Reactor Test mock-up, 11: 10531, 11567(R)

operation of slurry blanket test facility for the Homogeneous Reactor Test, 11: 9469

performance, 11: 8445

performance of Homogeneous Reactor Test mock-up, 11: 9287

performance of high-velocity, 11: 7604

reactor criticality effects in the Homogeneous Reactor Test, 11: 12878

testing, 11: 6700(R), 11682(R)

testing in Materials Testing Reactor Mockup, 11: 11803

testing of, in Liquid Metal Fuel Reactor, 11: 7734(R)

Corrosion-resistant alloys

welding metallurgy of, 11: 10580(J)

Corticosterones

concentrations and secretion rate in suprarenals of irradiated rabbits, 11: 7059(J)

Cortisone

effectiveness for therapy of radioinduced lung lesions, 11: 9964(J)

therapeutic effects on radiation injuries, 11: 10406(J)

Cosmic alpha particles

energy spectrum of primary, 11: 2950(J), 3448(J)

flux of primary, over Sardinia, 11: 10127(J)

measurement of flux at 41°N geomagnetic latitude using nuclear emulsions, 11: 10125(J)

Cosmic electrons

energy spectra, 11: 2027(R)

Cosmic mesons

daily variation of intensity of, at Ahmedabad, 11: 4510(J)

detection and measurement, counter telescope for, 11: 9054(R)

directional intensities of + and −, in the atmosphere, 11: 1200(J)

Cosmic mesons (cont'd)
mass measurements, 11: 5927(J)
multiple production in cosmic ray jets, 11: 5921(J)
observation and absorption, 11: 521
telescope for detection of, zenith angle sensitivity, 11: 6839(J)
Cosmic mesons (μ)
intensity of high-energy, atmospheric effects, 11: 5382(J)
interactions under ground, 11: 4506(J)
momentum spectrum and ratio to protons at 3200 m above sea level, 11: 1936(J)
momentum spectrum of, at depth of 40 m water equivalent, 11: 1934(J)
neutron production in Pb by, at sea level, 11: 3890
size-frequency distribution of bursts produced by, fluctuation problem in, 11: 6428
underground shower production by, 11: 10126(J)
Cosmic mesons (μ^+)
intensity, correlation with atmospheric pressure at sea level and height of 100 mb layer, 11: 5920(J)
Cosmic mesons (π)
cosmic ray intensity, temperature effect related to absorption and disintegration of, 11: 4909(J)
detection with nuclear emulsions, 11: 4504
flux variation underground, 11: 4506(J)
Cosmic mesons(π^+)
decay, angular correlations in, 11: 12166(J)
Cosmic neutrons
cross section for, interaction with Fe at 50 Bev, 11: 9357(J)
intensity and energy spectrum, 11: 2949(J), 4907(J), 4908(J)
Cosmic particles
(See also Electrons; Mesons.)
acceleration among extragalactic nebulae, 11: 10598(J)
angular and spatial distribution functions in cascade shower maximum, 11: 9356(J)
charge distribution, 11: 403(J), 4507(J)
charge distribution of multiply charged, in primary cosmic radiation, 11: 12774(J)
decay of slow secondary, K mesons in, 11: 3446(J)
detection using plastic scintillators, 11: 12089(J)
disintegration in nuclear emulsion, 11: 8041(J)
energy and identification of particles, 11: 1197, 3892(J)
energy spectrum of penetrating, 11: 1938(J)
flux of light elements at 41°N geomagnetic latitude, 11: 8950(J)
heavy unstable particles, formation and decay, 11: 2946(J)
interpretation of multiple penetrating, 11: 6765(J)
nuclear interactions of heavy, in nuclear emulsions, 11: 5924(J)
observations of multiple penetrating, 11: 6764(J)
orbits in geomagnetic field, calculations, 11: 5926(J)
primary, energy spectrum, 11: 12089(J), 12090(J)
shower bursts induced by, 11: 6429(J)
Cosmic protons
altitudinal variations, 11: 2027(R)
cross section for, interaction with Fe at 50 Bev, 11: 9357(J)
Cosmic protons (cont'd)
diffusion equation for, emitted by constant energy pulsed source, 11: 4511(J)
diffusion equation of, in interstellar space, 11: 396(J)
distribution at sea level in cosmic ray soft component, 11: 3897(J)
energy spectra, 11: 2027(R)
flux variation underground, 11: 4506(J)
nuclear interactions in Pb by, at 3500 m, 11: 1547(J)
ratio to μ mesons at 3200 m above sea level, 11: 1936(J)
zenith angle dependence at sea level, 11: 397(J)
Cosmic radiation
absorption of nucleonic components of, at −15° geomagnetic latitude in Argentina, 11: 12771(J)
absorption studied by scintillation counters, 11: 3452(J)
acceleration in solar flares, 11: 12775(J)
anisotropy due to galactic rotation, 11: 402(J)
anisotropy during cosmic-ray storms, 11: 3449(J)
balloons for studies of, at 80,000 to 105,000 feet, 11: 5457(J)
beryllium^7 produced by, snow content, 11: 6762
biological effects on living tissues, 11: 4782
biological problems in interplanetary flights, review, 11: 1757(J), 1759(J)
cascade theory, 11: 4509(J)
cascades, random functions of, 11: 8956(J)
charge distribution of multiply charged nuclei in primary, 11: 12774(J)
Cherenkov detector for, with adjustable velocity threshold, 11: 3492(J)
composition of primary, 11: 12776(J)
contribution to background radiation, 11: 50
cutoff at sunspot minimum, interpretation in terms of interstellar magnetic fields, 11: 407(J)
density distribution of extensive showers, 11: 2953(J)
detection and measurement, 11: 1542(R), 5446(J)
disintegration of hyperfragments, 11: 10130(J)
diurnal variations, 11: 3891(J)
east-west asymmetry, changes in high-latitude, 11: 8042(J)
electrophotonic component at great depths, 11: 4505(J)
energy spectra of multiply charged nuclei in primary, 11: 6767(J)
energy spectrum of extensive air showers, 11: 2952(J)
fluctuation problem in μ-meson bursts, 11: 6428
galactic diffusion, factors effecting, 11: 13363(J)
geomagnetic cut off energies and temporal variations of primary, 11: 10124
heavy nuclei in primary, time variation, 11: 405(J)
heavy primary cascades, 11: 12773(J)
high energy cross section measurements, lateral and size distributions, arrival directions, and μ-meson component of large air showers, 11: 9186(R)
high energy nuclear particles from α-particle, 11: 398(J)
hyperfragments emitted from stars, 11: 10596(J)
increase at high altitude on Feb. 23, 1956, 11: 406(J)
injection energies, 11: 5381(J)
intensities, sources of variations in, 11: 408(J), 3451(J)
intensity measurement by Be^{10} method, 11: 13366(J)

Cosmic radiation (cont'd)

intensity of α particles and Li, Be, and B nuclei in, at λ = 41.5°, 11: 3448(J)

intensity variations on Jan. 21–23, 1957, 11: 5918(J)

interaction with materials underground, 11: 400(J)

interactions with various nuclei, neutron production from, 11: 687(J)

ionization spectrum of soft component at sea level, 11: 3897(J)

ions in, absolute intensity, 11: 1932(J)

manganese^{53} produced in iron meteorites by, 11: 4503(J)

measurements of intensity in three latitudes of Argentina, 11: 12770(J)

meson (μ) component at 3200 m, 11: 1936(J)

meson (π^+) formation in, 11: 1937(J)

meson production by, in Pb, Cu, and C nuclei, 11: 1939(J)

meson showers produced by heavy primary particles, 11: 8949(J)

multiple meson production in, 11: 8951(J)

neutron production in Pb by, 11: 6494(R)

nuclear disintegration cascades by heavy primaries in nuclear emulsions, 11: 5923(J)

nuclear emulsion data, summary, 11: 4504

nuclear interactions in nitrogen gas, 11: 12088(J)

nuclear interactions with Ar and Al, 11: 9358(J)

nuclear size studied by interactions with, 11: 6058(J)

observation with rocket equipment, 11: 3895(J)

observatory, design of shipboard, 11: 6866(R)

origin, 11: 8043(J)

origin in supernova explosions, 11: 1935(J)

origin of, theory, 11: 11278(J)

outburst of high intensities, observed at various longitudes, 11: 1198(J)

parent stars of K^+ mesons produced by, 11: 8953(J)

penetrating component of, at great depths, 11: 2945(J)

pions produced in nuclear emulsions by, energy spectrum, 11: 3898(J)

primary spectrum, changes in low-energy cutoff for particles in, 11: 6769(J)

production of S^{35} in rain water by, 11: 3447(J)

production rate of Be^7, 11: 1933(J)

progress in cosmic ray physics, review, 11: 1940(J)

research at Massachusetts Institute of Technology, 11: 1542(R)

research program in Soviet Union, 11: 12092(J)

ring current effects on, 11: 2947(J)

size-frequency distributions of ionization bursts near sea level, 11: 5925(J)

solar, of February 1956, 11: 1550(J)

solar anisotropy, interpretation of, 11: 10132(J)

solar influences, 11: 404(J), 3893(J), 3894(J)

splitting of heavy nuclei of primary components of, forming α-particles, 11: 399(J)

stars produced in cloud chambers by, 11: 4911(J)

stars produced in nuclear emulsions at equator and at high altitudes, 11: 4910(J)

stars produced in photographic plates, close-pair effect, 11: 409(J)

stochastic processes in, theory, 11: 410(J)

Cosmic radiation (cont'd)

temperature effect on intensity of, due to π -meson absorption and disintegration, 11: 4909(J)

thin-down and breakup of large-Z primary, 11: 12091(J)

time variations in, review, 11: 5380(J)

transition curve, liquid scintillator investigation, 11: 2951(J)

transition effect in Pb, 11: 5383(J)

tunnel theory of jets, evidence for, 11: 8952(J)

unusual events in, descriptions, 11: 401(J)

variations with solar activity, near north geomagnetic pole in summer of 1955 and 1956, 11: 11277(J)

Cosmic-ray spectra

low-rigidity, during solar flare of Feb. 23, 1956, 11: 9359(J)

Cosmic ray spectrometers

zenith angle sensitivity of a cubical meson telescope, 11: 6839(J)

Cosmic showers

angular distribution of π° mesons produced by high energy jet, 11: 13365(J)

apparatus for observation of, 11: 8954(J)

cascade theories, 11: 563(J)

cascade theory of, including ionization loss, 11: 7224(J)

core detection and core structure of extensive air, 11: 8957(J)

cross section for production of underground, energy dependence, 11: 3896(J)

density distribution, 11: 2953(J)

depth-intensity curve of penetrating particles in, 11: 1938(J)

diurnal variations of large, 11: 13364(J)

emission frequency dependence on spallated nucleus atomic number, 11: 12772(J)

energy spectrum, 11: 1199(J), 2952(J)

high-energy nuclear active particle, theory, 11: 9355(J)

induced by heavy particles, 11: 6429(J)

intensity variation of vertical, 11: 6768(J)

interpretation, 11: 6766(J)

interpretation of jets observed in photographic emulsions, 11: 10597(J)

lateral distribution of charged particles, 11: 10128(J)

lateral distribution of μ mesons in, 11: 12186(R)

lateral distribution of penetrating particles in air, 11: 10129(J)

multiple meson production and angular distribution of shower particles produced in, 11: 5921(J)

nuclear-active particles in, 11: 3892(J)

observation of high-energy jet of type 20 + 56p in nuclear emulsion, 11: 3450(J)

observations on penetrating underground, 11: 6763(J)

size, spectrum, and atmospheric energy absorption, 11: 12089(J), 12090(J)

time variations in the energy region of 10^{17} ev, 11: 8955(J)

response of liquid scintillation counter to extensive air showers of low density, 11: 12154(J)

underground, produced by μ mesons, 11: 10126(J)

Cosmology

stellar evolution, nuclear astrophysics, and nucleogenesis, 11: 11273

Coso Mining District (Calif.)

geology and U occurrence, 11: 7191

Coulometry

integrated-current source for, 11: 10444(J)

Countercurrent separation processes

design and operating characteristics of centrifugal extractors, 11: 1827(J)

ion exchange, development and applications, 11: 189(J)

Counters

See Coincidence circuits; Counting devices; Radiation detection instruments; Radiation detectors.

Counting devices

(See also Radiation detection instruments; Radiation detectors; Scalers.)

binary, transistorized design for extreme conditions, 11: 2562

circuits, 11: 10148

design and circuits for preset unit, 11: 10615

design of automatic, 11: 8973

design of cold-cathode register, 11: 10614

design of direct digital indicating dial, 11: 2568

design of electronic, with reliable triggering circuit, 11: 9554(P)

design of plug-in decade counters employing transistors, 11: 11298

design of pulse-shaping circuit for electronic, 11: 9553(P)

design of programing digital register for automatic counting plots, 11: 6836(J)

design of rotating capacitor for, 11: 8071

reversible digital transducer and counter design, 11: 2574

sample changing device, 11: 1275(R)

Couples

(Specific couples are indexed under the name of the first member with the members arranged in alphabetical order.)

Coupling circuits

design of logic circuits employing feedback, 11: 9383

CP-Reactors

(See Argonne Research Reactor; Experimental Breeder Reactor; Argonne Graphite Reactor; Argonne Heavy Water Reactor; Argonne Neutron Production Reactor.)

Creatinine

synthesis in dogs, effects of irradiation, tracer study, 11: 13231

urinary excretion, 11: 5129

urine levels in irradiated animals, 11: 3285(J), 11874(J), 12640, 13241(J)

Creep

activation energy of high-temperature, in metals, 11: 8033(J)

apparatus for approximating constant stress, 11: 3928(J)

bibliography for structural engineers, 11: 255

equipment for measuring, 11: 3849

irradiation experiments, 11: 8548(R)

machine for testing short-time, at 2000 to 2500°C, 11: 10152(J)

mathematical analysis, 11: 10798, 12744

mathematical analysis of Zircaloy-2, 11: 4452

Creep (cont'd)

measurement and evaluation, 11: 12020

measurement in metals, equipment, 11: 1539(J)

methods for determining properties under compressive bearing and shear type of loading, 11: 10519

nucleation of voids during metal, 11: 4463

rate equation for extrapolation of data, 11: 12741

stress relationship in steel, determined by extrapolation of data, 11: 7201(J)

temperature effects on, in aircraft structures, 11: 1505

test facility for Zr, 11: 2506

testing, automatic electromechanical stressing unit for, 11: 1225(J)

testing equipment at elevated temperatures, 11: 8679(R)

theory, 11: 8005

Critical assemblies

(See also Neutron sources; Reactors.)

accident reports, 11: 11763

accidential prompt-critical radiation bursts, 11: 10272

buckling of, 11: 1177, 2126

control rod testing for neutron absorption, effectiveness, 11: 1659

critical mass measurements on graphite-U^{235} systems, 11: 10293

critical masses and diameters of pseudospheres, 11: 13166

criticality of bare Be-moderated, 11: 1618(R)

criticality of homogeneous UO_2F_2 water moderated, induced by over-addition of fuel, 11: 7812

criticality studies for graphite-UO_2, 11: 12571

criticality studies of graphite-U, 11: 14016

criticality studies of mock-up of reflector-covered intermediate reactor, 11: 13938

criticality studies of water-moderated slightly enriched U lattices, 11: 12603

danger coefficient studies in Topsy and Godiva, 11: 13955

design, 11: 12888(R)

design, for fuel loading studies, 11: 10735

design, for reactor matrix reactivity measurement, 11: 2679

design and hazards summary of Engineering Test Reactor mockup, 11: 6895

design and operation of Topsy, 11: 13164

design and properties of oralloy hydride, 11: 4093

design and safety, 11: 9790

design for reactor materials reactivity measurements, 11: 13918

design of Engineering Test Reactor, 11: 9052(R)

design of Hydro, 11: 10273

design of small thermal homogeneous, 11: 682(J)

enriched U-Zr, experiments in Shippingport Pressurized Water Reactor facility, 11: 10738

fuel elements for, fabrication of Teflon, 11: 3062

fuel plate fabrication techniques, 11: 7725

homogeneous, mathematical analysis, 11: 1654(J)

loading, 11: 6896

loading for flat flux, 11: 10735

measurement of lattice constants in two-region, 11: 13517(J)

multiplication curve, effect of number of bundles, 11: 2126

Critical assemblies (cont'd)

neutron detector traverses in Topsy and Godiva, 11: 13954

neutron flux distribution in bare Be-moderated, 11: 1618(R)

neutron flux distribution with partially inserted control rod, theory, 11: 10288

neutron spectra, effect of Doppler effect on, 11: 13879

organic moderators for, 11: 2118

plutonium–water, characteristics, 11: 682(J)

power excursions in, self-shutdown features associated with, 11: 5031

prompt neutron periods of metal, 11: 10311(J)

reactivity contribution data, 11: 12211

reactivity effects of inhomogeneities in, 11: 6521(R)

reactivity experiments in Godiva, 11: 13953

reactivity measurements with Nuclear Test Gauge, 11: 13517(J)

reflector arrangement and composition effects, experimental and theoretical study, 11: 10294

reflector saving in Al–U heterogeneous water-moderated, 11: 2126

safety, 11: 13498

safety hazards, control of, 11: 10279

safety limits of hand stacking cubes of U^{235} in spherical geometries, 11: 13166

Criticality studies

(See also Multiplication factor.)

of annular cylinders, iterative technique for, 11: 6924(J)

application of Reactor Safety Experiments, 11: 10752(J)

of Army Package Power Reactor, 11: 13184

bibliography on criticality hazards, 11: 2226

for Bismuth Phosphate Separation Process at Hanford, 11: 8372

boundary conditions for calculating critical dimensions, 11: 682(J)

burst characteristics, mathematical analysis, 11: 2120

calculation methods for spherical active cores, 11: 1637

calculations for hydrogenous assemblies, 11: 8184(J)

critical conditions for UO_2F_2, 11: 14038

critical dimensions of water tamped enriched uranyl fluoride–water systems, 11: 8753

cylinders of U^{235} with air, water, and Cd reflectors, 11: 11827

design and equipment of special purpose slide rule for computing solid angles, 11: 12803

on elementary fast-neutron assemblies, 11: 13965

empirical, for water-enclosed stainless steel reactor, 11: 12615

on enriched reactors, 11: 13147

on enriched uranium–heavy water systems, 11: 9838

fuel enrichment for various reactor sizes, method for rapid estimation, 11: 13941

of heavy water reactors, facilities, 11: 8684

hydrogen slowing-down method for, 11: 12505

of interacting containers of fissionable materials, 11: 13853

for Intermediate Scale Homogeneous Reactor, 11: 13131

of mock-up of reflector-covered intermediate reactor, 11: 13938

multigroup-multiregion theory for application to reactor criticality computations, 11: 647

nuclear hazards from ball mills for enriched U, 11: 7901

Criticality studies (cont'd)

neutron interaction of identical spheres and infinite cylinder, 11: 1177

parameters for proton moderated and reflected U^{235} slabs, 11: 7810

pipe intersections, empirical method for calculating sub-critical, 11: 12509

of plutonium in cylindrical geometry, 11: 13107

on postulated accidental reactions at K-25 plant, 11: 13211

preliminary, of Aquarium reactor, 11: 2663

pulsed neutron source applications, 11: 9432

radiation hazards and criticality of $Pu(NO_3)_4$–water systems, 11: 7820

reactivity, effect of ring tamping, 11: 13859

reactivity changes for different pile loadings, 11: 8667

reactor critical concentrations, effect of poisoning, 11: 8590

safety, 11: 56(J)

sizes for cylindrical reactors, 11: 1322

thermal neutron absorption cross sections measured with pile oscillator, 11: 7309

of uranium salt solutions in Pyrex vessels, 11: 14039

for uranium (U^{235}) in UO_2F_2 in cylinders, 11: 13855

of vessels in separation plants, 11: 184

of water boiler reactors, 11: 9846

Cross sections

(See also specific cross sections, e.g., Meson cross sections; Neutron cross sections.)

atomic, in spectra excitations, 11: 9523(J)

calculation from crystal spectrometer data, computer program for, 11: 8080

for displacement of atoms by heavy particle irradiation, 11: 6962(J)

energy dependence near threshold for neutral particles, 11: 6979(J)

of fissile nuclei, conference, 11: 10244

minutes of meeting on nuclear, on Mar. 12-14, 1956 at Chalk River, 11: 6509

minutes of meeting on nuclear, on Nov. 5-7, 1956 at ORNL, 11: 6510

recent developments, changes in emphasis preliminary data, research programs, 11: 13117

research programs of various laboratories, summary, 11: 13115

Crucibles

(See also specific types of crucibles, e.g., Beryllium oxide crucibles; Calcium oxide crucibles.)

casting, design with stationary plug, 11: 3249(P)

evaporation, for preparing radioactive samples for β spectrometers, 11: 3918(J)

fabrication for reduction of U halides, 11: 7020(P)

fabrication of, for melting and casting U and other metals, review, 11: 4859(J)

impregnated with ThO_2, ZrO_2 or BeO for handling molten U, 11: 3225(P)

liners for uranium halide reduction, 11: 11521(P)

two-piece centrifuge, for handling microchemical precipitates, design, 11: 13281(J)

Crustacea

concentration of Co^{60} from radioactive fall-out by killer clams, 11: 6228(J)

Cryogenics

bibliography on, 11: 6748

Cryogenics (cont'd)
data on properties of liquids, gases, and solids, 11: 386
developments in very low temperature physics and engineering, 11: 3880(J)
low temperature irradiation facility at Materials Testing Reactor, feasibility, 11: 2692
low temperature scale combining T_{58E} and T_{L58}, 11: 3443(J)
techniques and equipment used in low-temperature reactor irradiation, 11: 7280(J)

Cryostats
design and operation, 11: 1922(R)
design for low-temperature reactor irradiation experiments, 11: 7280(J)
design for maintenance of temperatures between those of liquid helium and nitrogen, 11: 8942(R)
design for spectrophotometric measurements, 11: 3927(J)
design for use in nuclear magnetic resonance studies, 11: 6793(J)

Crystal detectors
charge trappings in a diamond conduction counter, 11: 8117(R)
development of photoconductive dose rate indicators, 11: 4570(R)
growth of high-sensitivity CdS, 11: 7276(J)
performance of alkali halide for γ and x radiation dosimetry, 11: 1249(J)

Crystal structure
color centers and luminescence, 11: 5376(J)
defects, theory, 11: 14026
determination, direct methods of, 11: 1203
diffraction from dislocations, optical method of studying, 11: 10602(J)
diffraction from modulated, optical method of studying, 11: 10601(J)
diffusion in, effects of temperature, 11: 7888(R)
directional dilatation of metal oxide lattices at elevated temperature, 11: 10454(J)
electron interactions with lattices, 11: 442(J)
equations for a lattice gas, 11: 12096(J)
isotope effects on thermodynamic functions of hindered rotators, 11: 10008(J)
lattice defects in ionic solids, 11: 4912(J)
of magnus salts, $Pt(NH_3)_4$ $PtCl_4$, 11: 9237(J)
neutron diffraction analysis of $MnFe_2O_4$, 11: 6267(J)
nuclear quadrupole resonance investigation, determination of symmetry, 11: 9362(J)
radiation damage as shown by changes in x-ray diffraction pattern, 11: 12975
radiation damage defects, 11: 8942(R)
radiation effects, 11: 6565(J)
structural theory of the positional correlation of electrons in bonds, 11: 414(J)
theory, relation between bond hybrids and metallic structures, 11: 7226(J)
theory of electronic-vibrational interactions, 11: 10007(J)
ultrasonic effects on, 11: 5889(R)
vibration detection from particle bombardment by piezoelectric crystals, 11: 2757
x-ray-diffraction techniques for studying, 11: 6430(J)

Crystallography
of intermetallic compounds, 11: 1784(J)
x-ray-diffraction method for studying superficial layer structures, 11: 6430(J)

Crystals
(See also specific crystals, e.g., Alkali metal halide crystals; Aluminum crystals.)
atomic scattering factors, analytical representation of, 11: 6754(J)
device for cutting metal single, to exact orientation, 11: 4551(J)
diffusion of radioactive ions in, 11: 2938(J)
elastic properties, material constants in description of, 11: 12094(J)
electron-diffraction analysis of thin surface films, 11: 129(J)
evaporation from surface of, 11: 5386(J)
formation, equation for velocity of, and latent periods of crystallization, 11: 5928(J)
imperfections in, relation between concentrations, 11: 6427(J)
lattice defects, continuum theory, 11: 6427(J)
lattice vibrations and theory of specific heats, 11: 6426(J)
neutron incoherent scattering by poly-, 11: 5059(J)
neutron thermalization by, 11: 6860(J)
nuclear quadrupole coupling of B^{11} and Al^{27} in ionic, 11: 3596(R)
penetration by liquids, statistical analysis, 11: 10450, 10451, 10452
photoelectric and Compton absorption in, technique for analyzing, 11: 734
radiation effects, 11: 5668(J)
radiation effects in ionic, covalent, and metallic, x-ray studies, 11: 5066
thermoluminescence in inorganic, 11: 7219(J)
x-ray-diffraction analysis of irradiated, containing vacancies and interstitial atoms, 11: 411
x-ray scattering by point defects in, 11: 9771(R)
x-ray scattering of irradiated, theory, 11: 9772(R)

CTF (Core Test Facility)
See Aircraft reactor critical experiments.

Cupferron
separation of interferences before complexometric titrations, 11: 5785(J)

Cupferron complexes
extraction of Ni, Ta, and Ti, 11: 1830(J)
polarographic behavior of the uranyl-cupferron system, 11: 12310(J)

Curium
electrodeposition of thin films, 11: 8836(J)
ion-exchange separation from Am and Cf by elution with α-hydroxy isobutyric acid, 11: 1004(J)
molar susceptibility in CmF_3, 11: 2254(R)
paramagnetic resonance, 11: 4650(J), 4814(R)
preparation of small quantities, 11: 12341(R)
solvent extraction, 11: 13633(R)
sorption on Dowex-50 resin, 11: 4376(J)

Curium fluorides
magnetic susceptibility of Cm^{+3}, 11: 2254(R)

Curium isotopes
nuclear properties, 11: 13443
production in Be shim rods of Materials Testing Reactor, 11: 1328
spontaneous fission energy release, calculated, 11: 13444
thermal neutron cross sections, review, 11: 10245

Curium isotopes Cm^{241}

half life and decay properties, 11: 9591(R)

Curium isotopes Cm^{242}

fission products, 11: 9579(R)

gamma decay, 11: 2077(J)

spontaneous fission, 11: 13578(R)

toxicology, 11: 893

Curium isotopes Cm^{243}

gamma decay, 11: 2077(J)

Curium isotopes Cm^{244}

alpha energy spectrum, 11: 9772(R)

Curium isotopes Cm^{247}

existence in nature, 11: 4557(J)

Curium isotopes Cm^{250}

half life, spontaneous-fission, 11: 13460(J)

Current integrators

design of μa, 11: 12124(J)

utilizing induction-type watt-hour-meter, 11: 1966(J)

Current regulators

(See also Voltage regulators.)

continuously variable high-current rheostat, 11: 4923(J)

design for electromagnets, 11: 9557(P)

Cutting tools

design and performance for flame cutting Al tubes in graphite matrix, 11: 1512

design of abrasive cutoff machine, 11: 10089

hack saw for cutting fuel elements under water, design, 11: 3379

performance in various cutting fluids, use of radioisotopes in study of, 11: 12009(J)

CVR

See Carrier Vessel Reactor.

Cyanide complexes

with cadmium, electrometric and polarographic studies, 11: 4828(J)

spectra and structure of $KAu(CN)_2$ in solid state, 11: 12302(J)

Cyanogen

detonation velocities in O_2 mixtures, 11: 6645(J)

Cybernetics

(See also Communication theory; Computers; Servomechanisms.)

automatic coding in programming, 11: 9374(J)

automatic translator on electronic calculating machine, 11: 1971(J)

1,3-Cyclohexadiene

preparation and polymerization, 11: 209(R)

Cyclohexane

radiation effects, 11: 4163

Cyclohexanol

dielectric behavior between +49 and −42°C, 11: 11061(J)

nuclear paramagnetic resonance of protons in solid, effect of temperature, 11: 10237(J)

Cyclone separators

capacity vs. void fraction and pressure drop, bibliography, 11: 4355

Cyclone separators (cont'd)

control, testing of automatic system for dual-clone, 11: 12321(R)

design, 11: 7501, 13985(R)

design and performance of dual-, 11: 6292

design and testing for liquid-liquid separation, 11: 7507(R)

design correlations, 11: 12321(R)

design for Homogeneous Reactor Test, 11: 7501, 12965(R)

design for solids discharge from, 11: 13582(R)

design for thickening and recirculating fuel suspensions in reactor tubes, 11: 11527(P)

design for Thorium Breeder Reactor, 11: 7501

design of liquid-solid, for removal of PuO_2 and fission products from core and blanket solutions, 11: 7792

design of underflow retention tank for, 11: 2417, 3753

development and separation efficiencies, 11: 7500(R)

development for liquid-liquid extraction, 11: 12993(R)

efficiency of hydroclone for removing solids, 11: 1846, 1847

feasibility study of canned rotor, for homogeneous reactors, 11: 8627

hydroclone, effectiveness for removing low solid concentration in HRT, 11: 2112, 2113, 3547, 6092

hydroclone efficiency, 11: 7859(R), 9869(R)

operation in underflow pot, 11: 3752

performance in processing homogeneous reactor fuel solutions, 11: 8619

performance in the Homogeneous Reactor Test, 11: 7809, 10292

performance in reactor coolant purification systems, 11: 2682

performance with 1 μ particles in aqueous media, 11: 1476

temperature distribution during operation, 11: 7417(R)

use of midget, for 1-μ particles, 11: 6665(J)

Cyclopentadienyl compounds

reactions with sulfur in CS_2, 11: 89(J)

synthesis of high temperature and nuclear radiation stable metal-cyclopentadienyl fluids, 11: 10042(R)

Cyclopropane

electron drift velocity in, 11: 4916(J)

isomerization, isotopic effects of T and C^{13}, 11: 7095(J)

Cyclorators

acceleration system, energy modulation of ion by RF on half of G slit, 11: 2747

collector efficiency, effect of general angle of incidence for ions, 11: 2746

Cyclotrons

(See also Synchrocyclotrons.)

acceleration of ions in 3-dee, 11: 1361(J), 7881

beam calibration, 11: 13836(R)

beam characteristics, 11: 8740(R), 8741(R)

beam defocusing, effect of scalloped orbit on, 11: 3145

beam profile unit performance, 11: 7889(R)

beams, applications in radioisotope production, 11: 12798

beams, design features, 11: 9579(R)

Cyclotrons (cont'd)

beams, low-energy meson, 11: 12283(J)

betatron oscillations in sectorial, linear theory, 11: 4140(J)

dees, spiral shaped, 11: 13531(J)

description of facilities at Y-12 lab in Oak Ridge, Tenn., 1950, 11: 13846(R)

design and cost analysis of clover-leaf, 11: 11816

design characteristics of Saclay, 11: 728(J), 729(J)

design characteristics of Thomas type, 11: 4016(R), 6131

design for fast-neutron cross-section measurements, 11: 590(J)

design of spiral ridge, 11: 4721, 5051, 5633

development at Oak Ridge National Laboratory, 11: 9888(R)

development of, with azimuthally varying field, 11: 8727

diffusion pump gas recovery system, 11: 7036(P)

electrostatic focusing device for Harwell f-m, 11: 4135

frequency, automatic tuning control for, 11: 2743

frequency modulation and r-f system for modified Berkeley, 11: 3185(J)

heavy particle acceleration, 11: 13836(R)

index to information available on the Crocker 60-in., 11: 12280

ion sources, polarized, 11: 13527

magnet shims for field modulation, 11: 5052

operation, 11: 7292(R)

operational and development report, 11: 8568(R)

oscillators for 27-in., starting and operation of, 11: 1675

phase stability in, with fixed frequency field law, 11: 3102

proton, design of 3-dee, 3 phase, 11: 733(J)

r-f system for 36-in., changes in duo beams, and pumping arc source, 11: 1273(R)

radiofrequency modulation system, design, 11: 9560(P)

radiofrequency accelerating voltage system, 11: 5115(P)

radiofrequency synchronizer for, 11: 3258(P)

sectioned magnet system, 11: 1359(J), 3185(J)

shielding, 11: 13571(R), 13836(R)

spiral ridge, non-linear effects, 11: 13524

vacuum seal design for, 11: 4615(R)

Cylinders

backscattering properties for electromagnetic radiation, 11: 7351(J)

concrete, stress distribution in, 11: 2763

concrete, temperature distribution in, 11: 2763

critical dimensions of, containing aqueous solutions of U^{235}, 11: 12632

criticality and multiplication factor for homogeneous reactor, 11: 1322

drag coefficients of various shaped, 11: 8024

gamma streaming through, in water, 11: 13884(R)

heat transfer between gases with large temperature difference, 11: 6707(J)

heat transfer from, to flowing water, 11: 13048

Cylinders (cont'd)

heat transfer to small, in high temperature subsonic gas stream, 11: 12722

homogeneous, containing uniform source distribution, flux from, 11: 2760

mechanical properties, bibliographies, 11: 10511

neutron collision probabilities in, mathematical analysis, 11: 541

neutron diffusion in, 11: 682(J), 2616

neutron flux calculations in air gaps, 11: 9049(J)

neutron flux distribution, 11: 9885

neutron flux distribution in infinite annular, two-group iteration method for calculating, 11: 6071

radiation fluxes in, from idealized entering current, 11: 4931

radiation from neutron-activated, calculations, 11: 6043(J)

solid angle calculations, 11: 4016(R), 6458

steel, structural response to internal loading, 11: 11171(R)

stress and strain analysis, 11: 2443, 2450, 5296(J)

surface temperature transients effect of thermal shock, 11: 3383

temperature distribution and thermal stresses, 11: 13046

temperature distribution calculations for heat generating, 11: 14004

thermal stress calculations, 11: 3072, 4684, 10641

thermal stress distribution in long, thin-walled, 11: 13149(R)

Cystamine

See Ethylamine, 2, 2'-dithiobis-.

Cysteamine

See Ethanethiol, 2-amino-.

Cysteinamine

See Ethanethio, 2-amino-.

Cysteine

effects on protein solutions irradiated by x ray or ultraviolet rays, 11: 1807(J)

protective effects against radiation injury, 11: 4252(J), 5168(J), 5741(J), 5745(J)

radiation effects, 11: 13565(R)

radiosensitivity effects in rats, 11: 11961(J)

solutions, effects of atomic hydrogen on, 11: 11076(J)

Cytidylic acids

enzymatic activity of rat tissue toward, effects of total-body x-irradiation, 11: 8779(J)

Cytology

bone marrow, radioinduced changes, 11: 3656(J)

influence of structure on information content in Paramecium, 11: 7910(R)

Cytoplasm

radioinduced changes in protein of liver cells, 11: 13242(J)

D

D1G
See Naval Reactors (D1G).

Danger Coefficient Test Facility
design, operation, safety, and site location, 11: 10977

Danger coefficients
(See also Multiplication factor; Neutron cross sections.)
in GLEEP, nuclear calculations, 11: 4070
measurement by oscillator technique, 11: 13497
measurement for Hf, B, and Cd, 11: 13161
measurement of reactor materials, design of subcritical assembly for, 11: 13918
theory, in intermediate reactors, 11: 2695
of xenon in reactors, tables, 11: 12883

Daniels Power Reactor
design of, for studying engineering features of a nuclear power plant, 11: 2718
fuel rod alignment testing with air pressure, 11: 7841
fuel tubes of graphite and BeO for, thermal stresses in, 11: 8683

Dapex Process
cost factors and flowsheets, 11: 978
density, viscosity, and interfacial tension of aqueous and organic phases, 11: 3359(R)
development, 11: 10475(R)
development and description, 11: 7090(R)
efficiency, 11: 8869(R)
feed preparation, 11: 2859(R)
flowsheets and equipment, 11: 981, 2858
progress report, 11: 12994(R)
slime effects and Dapex reagent testing, 11: 980(R)
for U recovery from acid liquors, 11: 2860(R), 3361(R), 3759

Darex Process
development studies, 11: 12365, 13682(R)
feed adjustment studies, 11: 13661(R)
flowsheet and process efficiency, 11: 5270(J)

Data recording systems
application to nuclear power test stations, 11: 3919(J)
automatic counting system for neutron distribution, 11: 5968(J)
design of remote operated multiple oscilloscope and camera programmer, 11: 8069
feasibility of pulse amplitude storage, and application to nuclear physics, 11: 5439
for mass spectrometers, 11: 7706
for nuclear pulse amplitudes, design, 11: 3926(J)
Nulli IV, for statistical data plotting, 11: 2586
Rawidar (radar wind data recorder), 11: 2577
theory of time-varying sampled-data system, 11: 10512

David Sarnoff Research Center, Princeton, N. J.
progress reports on electronic devices for nuclear physics, 11: 1245(R), 1247(R), 1965(R)
progress reports on photomultiplier tubes, 11: 11301(R), 11302(R)

Deadwood Formation (Wyo.)
exploration, geology, and mineralogy, 11: 5316

Decay curves
linear method for resolving complex, 11: 9163(J)

Decay schemes
(See also specific modes of decay, e.g., Alpha decay; Beta decay.)
classification methods for isotope, 11: 775(J)

Decay series
alpha and γ spectra of U^{230}, 11: 780(J)
conversion-electron spectrum of U^{230}, 11: 781(J)

Decontaminating solutions
(See also Cleaning solutions.)
chromous sulfate, 11: 4692(R), 6536(R)
corrosion of Stellite, Inconel, Zircaloy II, and stainless and C steels in, 11: 8708(R)
corrosive effects on metals and alloys, 11: 9109(R)
corrosive effects on stainless steel, 11: 3813
for disactivation of hands contaminated by radium salts, 11: 10414(J)
effectiveness for decontaminating painted surfaces, 11: 4246, 5732
effectiveness for removing uranium from protective clothing, 11: 12650
effectiveness for washing protective clothing, 11: 12649
effectiveness in removing UO_2 activity from stainless steel surfaces, 11: 9727
evaluation, 11: 12608(R)
high-temperature stability, 11: 11430
performance of $CrSO_4-H_2SO_4$, in homogeneous reactor loops, 11: 13647(R)

Decontamination
of aqueous solutions by precipitation, 11: 3227(P)
of buildings and equipment used for manufacture of Ba^{140}, 11: 7454
of painted surfaces, 11: 5732
procedures in a Be–Po source rupture, 11: 13571(R)
removal of α activity from effluent water by tannic acid and lime, 11: 10033

Decontamination of equipment
application of ultrasonics to, 11: 11915
dry box design for radioactive fall-out removal, 11: 11104
in sodium reactor system components, 11: 7931

Delay lines
design of register using, 11: 465(J)

Delayed neutrons
criticality effects on, of Intermediate Scale Homogeneous Reactor, 11: 7772
emission and properties, 11: 1654(J)
emission in Homogeneous Reactor Test and K-49 fuel solutions, 11: 8611
energy spectra of, from thermal fission of U^{235}, 11: 2021(J)
measurement, 11: 590(J)
monitoring in reactor coolants for detection of sheath failures in fuel rods, 11: 8097(J)
prediction of precursors, 11: 10242(J)
properties of, review, 11: 3506

Delta rays
See Electrons.

Densitometers
design, 11: 12584(R)

Densitometers (cont'd)

design and operation of magnetic, 11: 4919

design of cathode-ray tube, 11: 10812(R)

electromagnetic, calibration, 11: 9863(R)

for metering densities of flowing streams, 11: 3466

micro-, design of, 11: 9589(R)

Density

determination in Purex Process streams, 11: 11585

determination in Thorex Process streams, 11: 3697

of liquids, measurement precision, 11: 2330

methods of measurement as a means of determining alloy composition, 11: 12489

Denver. Univ. Denver Research Inst.

progress reports, 11: 4378(R)

progress reports on development of high temperature stable and radiation resistant lubricants and hydraulic fluids, 11: 11133(R)

Deposits

See Mineral deposits and specific deposits, e.g., Pitchblende deposits.

Desert Lake Quadrangle (Utah)

photogeologic map, 11: 9316(J)

Detectors

See specific types of detectors, e.g., Luminescent detectors; Plastic-film detectors.

Detergents

efficiency as degreasing agents for U, 11: 8414

Detonation waves

(See also Atomic explosions; Detonation waves; Explosions; Shock waves; Thermonuclear explosions.)

density ratio, effects of pressure, composition, and temperature on, 11: 2956(J)

flow towards inert gas center, analysis, 11: 4528(J)

stability of slow, 11: 5372(J)

steady-state, single-reaction-supported, 11: 4902(J)

Detroit. Univ.

progress reports on properties of CdS and ZnS crystals for detectors and crystal counters, 11: 1201(R)

Deuterium

analysis for N_2, 11: 7108

biological effect in normal and neoplastic tissues in mice, 11: 8777(J)

biological effects in mice, 11: 13229(R)

catalytic oxidation, 11: 6536(R)

catalytic oxidation in presence of $CuSO_4$, 11: 9587(R)

catalytic oxidation in reactor solutions, 11: 14014

catalytic recombination with O_2, 11: 8706(R)

cloud chamber operation with 23 atm., 11: 4575(J)

compressibility at low temperatures, 11: 2960(J)

concentration by NH_3-H_2 exchange, analysis of plant for, 11: 132

cryogenic data, 11: 386

determination in H_2, analytical device, 11: 9238(J)

determination in water by densimetric float method, 11: 6269(J)

deuteron reactions, polarization of neutrons from, 11: 4117(J)

Deuterium (cont'd)

deuteron reactions (d,n) and (d,p) at 6 to 14 Mev, cross sections and angular dependence, 11: 12912(J)

deuteron reactions (d,p), polarization of protons from, 11: 6939(J)

distribution coefficients, mathematical calculations, 11: 948(J)

electron g value in ground state, 11: 4044(J)

exchange and hydrogenation between ethylene and, on palladium, 11: 3719(J)

exchange between diborane and pentaborane, 11: 6276

exchange between D_2O and H_2, radiation effects on, 11: 3348(J)

exchange reactions for production of D_2O, 11: 3347

exchange with H_2, separation factor, 11: 136(J)

exchange with H_2O, mechanism of gamma induced, 11: 7405(R)

formation in solar atmosphere, mechanism, 11: 8192(J)

gamma reactions (γ,n), polarization of nucleons from, 11: 5621(J)

gamma scattering from 50 to 130 Mev, 11: 5655(J)

high-current gas discharge in, in longitudinal magnetic field, 11: 8962(J)

high resolution Raman spectroscopy, 11: 9174(J)

hyperfine structure of metastable atom, 11: 3017(J)

infrared spectrometric determination in water-d_2, 11: 5228(J)

isotope shift, finite volume effect, 11: 7294(J)

isotopic enrichment by slow evaporation of water, 11: 12128(J)

isotopic exchange, theory, 11: 139(J)

isotopic exchange between hydrogen and water vapor, 11: 5227(J)

isotopic exchange reactions between water and other substances, 11: 1568(J)

in isotopic hydrogen exchange between naphthalene and deuterium bromide, distribution coefficient, 11: 140(J)

mass measurement in mass spectrograph, 11: 619(J)

mass spectrographic determination in H_2, 11: 9381(J)

meson and hyperon production in, via secondary pions by proton bombardment, 11: 8198(J)

meson production in, 11: 1614(J), 5365(R)

neutrons from pulse discharge, 11: 432(J)

photopion production in, relative to that in hydrogen, 11: 8197(J)

pion photoproduction in, 11: 3003(J), 3631(J)

production, design of electrolyzer for, 11: 4546(J)

proton reactions, comparison as test of charge independence of nuclear forces, 11: 8123(J)

proton reactions, formation of mesons and hyperons in, 11: 6493

quadrupole coupling in deuterated water, 11: 11098

rates of reaction with hydroxyl radicals in $HClO_4$, 11: 11947

reaction with alkenes, 11: 134(J)

reactions with water, radiation effects, 11: 7406(R)

recombination with O_2 in a high pressure loop, 11: 4089(R)

separation, developments on industrial scale, 11: 12127(J)

separation by electromigration, 11: 11648

separation factor during distillation from salt solutions in H_2O-D_2O, 11: 5226(J)

separation from Intermediate Scale Homogeneous Reactor fuel solution, mechanical separator for, 11: 7765

separation from H_2 by reaction of Fe with steam, 11: 5275(J)

separation methods, bibliography, 11: 1487

Deuterium (cont'd)

slow neutron scattering by ortho- and para-, 11: 591(J)

solubility in nonpolar solvents, 11: 6660(J)

spectrographic determination in H, 11: 5759

thermal capacity of solid, between 0.3 and 13°K, 11: 8849(J)

tissue distribution in plant tissue, 11: 1407

Townsend ionization coefficient, 11: 1293(J)

Deuterium (liquid)

cryogenic data, 11: 386

hydrogen exchange between aromatic hydrocarbons and, 11: 1792(J), 1793(J)

Deuterium compounds

bibliography on, 11: 11998

density of liquid DBr, 11: 1454

hydrogen isotopic exchange in DBr, method of analysis and preparation, 11: 138(J), 11097(J)

infrared bands of D_2S, 11: 13416(J)

infrared spectrum of DF and variable thickness infrared cell, 11: 151(J)

isotopic equilibrium of liquid-vapor systems containing, 11: 1790(J)

kinetics of association-addition and elimination reactions, 11: 1789

kinetics of redox reactions, review, 11: 4832

solvolysis reactions, bibliographies, 11: 133

thermodynamic properties of HF–DF mixtures, 11: 4319(J)

Deuterium hydrides

high resolution Raman spectroscopy, 11: 9174(J)

nuclear resonance, spin-spin interaction, 11: 7406(R)

nuclear spin relaxation in solid, near the melting point, 11: 13450(J)

rates of reaction with hydroxyl radicals in $HClO_4$, 11: 11947

viscosity of mixtures of H_2 and HD between 14 and 300°K, 11: 13417(J)

Deuterium–hydrogen systems

exchange, catalytic effects of metal oxides, 11: 137(J)

exchange reactions, effects of catalysis on, 11: 12513(R)

Deuterium oxides

See Heavy water reactors; Water-d; Water-d_2; Water-dt.

Deuterium–water systems

proton relaxation in, with paramagnetic salts, 11: 6559(J)

Deuterization

methane, in alkene system with various deuterium atom concentrations, 11: 134(J)

Deuteron beams

produced by high current ion injector, 11: 3591(J)

Deuteron cross sections

stripping reactions (d,pn), calculated angular distributions, 11: 12277(J)

Deuteron sources

designs of pulsed, for Van de Graaff accelerators, 11: 730(J)

Deuterons

attenuation of 320-Mev, in U, 11: 8567

collisions with heavy nuclei accompanied by deuteron disintegration, 11: 6546(J)

coupling constants between nucleons in, 11: 4199(J)

deuteron reactions, 11: 592, 707(J), 2088(J), 3006, 8549(R)

Deuterons (cont'd)

diffractional scattering of fast, by nuclei, 11: 10239(J)

disintegration, antineutrino induced, 11: 4969(J)

disintegration, neutrino induced, 11: 4028(J)

disintegration of relativistic, in the electric field of the nucleus, 11: 2209(J)

biological effects on dry spores of B. subtilis, 11: 11867(J)

elastic scattering of polarized, 11: 4158(J)

elastically scattered by O^{16}, 11: 3195(J)

electromagnetic properties, 11: 578(J), 13471(J)

electron scattering by, 11: 4732(J)

energy spectrum of, stripped from He^3, 11: 9773, 9886(R)

excitation of characteristic K x rays from Au and Cu by, 11: 12932(J)

gamma reactions (γ,n), polarization of neutrons from, 11: 5492(J)

ground state, development of variational procedure for, 11: 1620(J)

high-energy kinematics of, data on, 11: 6867

identification in nuclear emulsions by grain counting, 11: 4118(J)

inelastic scattering and stripping theory of deuteron reactions, 11: 4624(J)

inelastic scattering in Materials Testing Accelerator target materials, 11: 9887(R)

interactions with protons at 390 to 650 Mev, total cross section, 11: 3583(J)

irradiation of GaSb and InSb, 11: 4745(J)

magnetic moment, 11: 4652(J)

meson photoproduction from, 11: 5477(J)

mesons (π^+) nonradiative absorption by, at 118 Mev, 11: 5985(J)

neutron elastic scattering by, at 2.45 and 3.27 Mev, 11: 6143(J)

neutron production in Be and U by reaction with 190-Mev, 11: 14018

neutron yields from thick targets bombarded with, 11: 4709(J)

nuclear reactions, relation between stripping and compound nucleus formation in, 11: 4126(J)

photodisintegration, dynamics, 11: 548, 577(J), 2048(J), 3023(J), 5518(J), 5696(J), 7308(J), 8196(J), 8568(R), 10329, 12825(J), 13454(J)

photon scattering by, 11: 9505(J)

pion interactions at 85-Mev, 11: 3981(J)

polarization in $d + \pi^- \rightarrow p + p$ and $d + \pi^- \rightarrow n + p$ reactions, 11: 10759(J)

production of high-energy, by He^3 stripping, 11: 8725, 10996(R)

range-energy and range-momentum curves, 11: 12281

reactions induced with, theory, 11: 4197(J)

reactions (d,p) of low-energy, mechanism, 11: 9437(J)

reactions with F^{19}, 11: 615(J)

reactions with light nuclei, 11: 4129(J), 13523(J)

scattering, dispersion contribution to high-energy electron-, 11: 1686(J)

scattering, theory of high-energy, 11: 11463(J)

scattering by heavy nuclei, elastic, 11: 13544(J)

scattering by protons, 11: 10708(J)

scattering lengths of slow neutrons on, 11: 5665(J)

scattering of K^+ particles by, 11: 5988(J)

stripping in C, polarization of protons from, 11: 703(J)

stripping reactions, virtual level, 11: 598(J)

stripping reactions and nuclear shell structure, 11: 5516(J)

stripping reactions on heavy nuclei, 11: 1347(J)

Dew point

measurement with a LiCl recorder, 11: 2249

Dewindtites

identity and conditions of deposition, chemical, optical, and x-ray data, 11: 1871(J)

Dextran

tissue distribution in irradiated rabbits, 11: 6215(J), 7695(R), 9576(R), 10803(R)

DFR
See Dounreay Fast Reactor.

Diabetes

carbon metabolism in, tracer study, 11: 1406, 4814(R), 5136(R)

Dialysis

equipment, 11: 11648

of uranium, Fe, Mo, W, and Cr, 11: 987

Diamonds

(See also Carbon; Crystal detectors.)

conduction counters, α-particle counting behavior, 11: 516(J)

electroluminescence, 11: 13369(J)

radiation effects, 11: 3733, 7405(R), 7406(R), 7455(R), 7882, 8266(R), 11564(R), 13367(J), 13578(R)

thermal expansion measurements, 11: 3827(J)

Diaphragm pumps

design for radioactive solutions, 11: 8705(R)

development for power reactors, 11: 2894(R)

failure in the Homogeneous Reactor Test, 11: 10292

high pressure, for reactors, 11: 13516(J)

performance, 11: 9708

Diaphragms

examination of stainless steel, from pulse-feeder pumps, 11: 9710

DIDO

engineering aspects and description, 11: 591(J), 3565(J), 3566(J), 4659, 5579, 5580, 5581, 6080, 9127(J)

fuel cycle, chemical separation schemes, fuel element manufacture and inspection, and effluent disposal, 11: 9483(J)

fuel element disassembly, 11: 11128(J)

nuclear data, calculations, 11: 5582

radioactivity hazard from argon at, 11: 10282

Dielectric breakdown

(See also Cables; Connectors (electric); Electric insulators.)

minimum voltage for, 11: 7233(J)

solid, modern state of theory, 11: 8058(J)

Dielectrics

(See also Electric insulators.)

current behavior and radiation damage in Plexiglas, 11: 6863(R)

electrical conduction, 11: 550(R), 2026(R)

high-temperature, development, 11: 3768(R)

properties at fixed frequencies and room temperature, tables, 11: 7985

properties of, for use in amplifiers, 11: 5411(J)

properties of, studied by millimeter waves, 11: 8026(J)

radiation detectors using, 11: 2757

radiation effects, 11: 550(R), 1805

testing of high K ceramic, for use as capacitors, 11: 3387(R)

thermal factors, 11: 9985

Dies

materials for U, properties, 11: 7656(R), 7657(R)

for uranium, materials, 11: 7658(R)

Diet

(See also Food.)

effects on absorption processes of small intestines following irradiation of dogs, 11: 1397

influence of fat content on survival of irradiated rats, 11: 8805(J)

Diethyl ether
See Ethyl ether.

Differential equations

complex eigenvalued, calculations, 11: 479(R)

eigenvalue problems, 11: 8991

finite difference methods for numerical integration, 11: 1577(J)

minimum-maximum problem for, 11: 5960(J)

solution for heat conduction problem, 11: 11740(R)

solution of linear, whose coefficients are multiply periodic series, 11: 10638

solution of the two-end-point problem for second-order, 11: 10166

theory and solutions, 11: 1236(J)

transformed to difference equations, asymptotic stability in, 11: 1576(J)

Differential thermal analysis

equipment for refractory materials at temperatures to 1575°C, 11: 11172

symposium on, 11: 11582

Diffraction gratings

in parallel light, theory, 11: 11992

plane, theory and performance in convergent light, 11: 10786

Diffusers

testing of, for high ratio of operating to standby flow resistance in orifice, 11: 13045

Diffusion

(See also Bonding; Gaseous Diffusion Process; Thermal diffusion; Grain-boundary diffusion; Permeability; Self-diffusion.)

analysis of C and B, into Ti, Zr, Nb, Mo, and W, 11: 11229(J)

analysis of C and B, into Ti, Zr, Nb, Ta, Mo, and W, 11: 1534

in atmosphere, theory and mathematical analysis, 11: 6615

coefficients of surface of metals, 11: 1131(R)

free, coefficient, theory of, 11: 1920(R)

in ionic compounds, review, 11: 6002

of ionized gas across a magnetic field, 11: 1215

isotope effect in metallic, 11: 5903(J)

in liquid systems, 11: 7088(R)

mass coefficients for chain C_7- and C_8-alkanes, 11: 8833(J)

mass transfer in, review, 11: 5373

in metals and alloys, review, 11: 5358(J)

of metals into oxides, bibliography, 11: 3832(R)

of nonelectrolytes in aqueous solutions, 11: 93(J)

nucleation of voids during metal, 11: 4463

of particles in solution, determination by β backscattering, 11: 7273(J)

relation of molecular reactivity to, 11: 4005(J)

of solids into solutions, mathematical analysis, 11: 1578(J)

Diffusion (cont'd)

theoretical analysis, 11: 11131(J)

turbulent, mathematical analysis, 11: 7160

Diffusion pumps

mercury, design, performance, materials of construction, and operation, 11: 1060

testing mercury and oil, for use with line recorder, 11: 13847

Digitoxin

preparation by tritium self-radiation method, 11: 13229(R)

tissue distribution, tracer study, 11: 13229(R)

Diketones

diazo derivatives of β-diketones, 11: 9213

polymers from bis(β-diketones), 11: 2876(R)

preparation of 4-(4- N, N-dimethylamenophenyl)-3,5-diacetyl-2,6-heptane-dione, 11: 207(R)

reaction mechanisms, 11: 12970(R)

Dilatometers

design for thermal length measurement, 11: 10077(J), 12794

to determine thermal expansion coefficient of alpha Pu, design of silica-tube and dial-indicator type, 11: 1523

Dioctylamine, N-methyl-

solvent properties, 11: 9662

Diodes

de-ionization, effect of ion sheaths surrounding electrodes, 11: 423(J)

gamma radiation effects on crystal, 11: 3206

germanium n-p transition counters, performance, 11: 6478(J)

radiation effects on silicon junction type, 11: 7365(J)

temperature coefficient of forward-biased junction, 11: 8025(R)

Dirt

See Soils.

Disaccharides

synthesis of C^{14}-labeled gentiobiose, 11: 2875

Disasters

(See also Reactor safety.)

atomic, radiological monitoring with photographic film and dental x-ray film, 11: 4588(J)

involving uncontrolled fission reactions, 11: 3301(J)

Disconnects

(See also Cables; Connectors (electric).)

thermal shock testing of Submarine Intermediate Reactor unit, 11: 12559

for underwater process operations, 11: 13006

Diseases

(See also Blood diseases; Heart diseases; Lymph diseases; Thyroid diseases.)

prevention of human helmenthic, by γ radiation of food, 11: 210(J)

Disks

hydrodynamics of oscillating, in viscous fluids, 11: 6339(J)

stress analysis, 11: 10065

stress distributions in rotating, subjected to creep at elevated temperature, 11: 8929(J)

stresses in, due to non uniform peripheral heating, 11: 2544

Disperse systems

(See also Aerosols; Colloids; Dusts; Emulsions; Particles; Slurries; Smokes; Solutions.)

interfaces, mass transfer, 11: 13582(R)

particle size distribution in fluidized beds, 11: 9223

Dissolvers

corrosion in Redox Process, 11: 13748

design and performance for continuous dissolving, 11: 11608(R)

design equations for, 11: 8351

iodine removal by isotopic exchange, 11: 7967

monitoring for off-gas I^{131} content, 11: 10175

operation of, in Homogeneous Reactor Test chemical plant, 11: 9621, 11120

Distillation

(See also Evaporation; Isotope separation methods.)

ebullition from solid surfaces in the absence of a pre-existing gaseous phase, 11: 6689(J)

low-pressure, for thermally unstable materials, 11: 6298(J)

Distillation apparatus

(See also Column packing; Evaporators; Packed columns.)

automatic control of continuous column, 11: 5755

construction, operation, and maintenance for fractionation of boron polymers, 11: 7463

design for distilling $POCl_3$ from $ZrCl_4-POCl_3$, 11: 2278(R)

design for vacuum distillation of organic acids in process solutions, 11: 8291

design of all nickel column for separating U and fission product fluorides, 11: 7476

design of countercurrent, reflux, molecular, 11: 7001(P)

use of spinning rotor in, 11: 3762(J)

Dithizone

radiation effects on solutions, 11: 7129(J)

solvent extraction of Po from HCl solution by, 11: 5274(J)

Division of Nuclear Materials Management, AEC

SF material accounting procedures, 11: 1

Division of Reactor Development, Washington, D. C.

reports of waste disposal seminar, Dec. 1955, at Cincinnati, 11: 1026

Dodecylamine acetate

adsorption on Ag_2S, 11: 3784, 4861(R)

adsorption studies in presence of, 11: 6237(R)

Dogs

lethal radiation dosage determinations, 11: 836, 11024

radiosensitivity, 11: 21

Dolomites

liquid sintering, effects of admixtures on sintering properties of basic oxides of, 11: 2897(J)

properties for U bomb tests, 11: 12405(R)

Dosimeters

See Radiation detection instruments; Rate meters.

Dounreay Fast Reactor

chemical and metallurgical plants, 11: 9126(J)

chemical facilities, 11: 10306(J)

Dounreay Fast Reactor (cont'd)

civil engineering, 11: 9128(J)

construction, 11: 9110(J)

description, development, and waste disposal system, 11: 7332(J)

design, 11: 12248(J)

diagrams, 11: 8181(J)

fuel cycle, chemical separation schemes, fuel element manufacture and inspection, and effluent disposal, 11: 9483(J)

fuel elements, 11: 11444(J)

fuel loading, fuel and power production, and drawing, 11: 9129(J)

operation of cooling system and safety and control rods, 11: 9124(J)

sphere, vault, core, core vessel, heat exchangers, and engineering, 11: 8180(J)

tank and heat exchange system, manufacture and installation, 11: 9125(J)

Dow Chemical Co., Midland, Mich.

progress reports on Mg alloys, 11: 3429(R)

Dow Chemical Co. Western Div., Pittsburg, Calif.

progress reports, 11: 982(R), 1018(R), 2856(R), 4942(R), 5256(R), 7142(R)

Dow Chemical-Detroit Edison and Associates. Atomic Power Development Project, Detroit

progress reports on project activities, 11: 11807(R)

Dow-Detroit Reactor
See Power breeder reactors.

DPR
See Hanford Dual Purpose Reactor.

Drawing

automatic recording of variables in metal, 11: 8002

Drills

apparatus for radioactive mineral prospecting, 11: 1713(P)

Driver-Harris Co., Harrison, N. J.

progress reports on commercial production of Ti and Ti alloy wire, 11: 316(R)

Drosophila

effects of highly irradiated diet on life span and development, 11: 6597

radiation effects on oögenesis in, 11: 13240(J)

radioinduced delay in pupation, 11: 2792(J)

radioinduced mutations, 11: 844(J), 6605(J), 8773(J), 9932(J)

sensitivity of spermatogenesis to fast neutrons, 11: 1743(J)

Drugs

effects of insulin, Orinase, and Carbutamide on glucose metabolism in normal and diabetic rats, 11: 1406

Dry batteries

high potential, for radiation detection equipment, 11: 7694(R)

Dry boxes

design, maintenance, and health physics, 11: 6274(J)

design for analytical manipulations, 11: 5804(J)

design for enclosing low-level radiation processes, 11: 8855

design for liquid-liquid extraction, 11: 8866

design for spectrographic analysis, 11: 2254(R)

design of double glove box for use with α emitters, 11: 5236

design of glove boxes for handling Pu, 11: 9246(J)

inert atmospheres in, optimum procedure for obtaining, 11: 2295

lubrication, 11: 10459

Dry boxes (cont'd)

for removal of fall-out from Hexcell collectors, design, 11: 11104

ventilation and air cleaning, equipment design for, 11: 4328

Drying apparatus

design, for use with uranyl sulfates, 11: 8381(R)

design for UO_3 pellets, 11: 10854

theory and tracer studies, 11: 13319(J)

Du Mont (Allen B.) Labs., Inc., Tube Research Labs., Passaic, N. J.

progress reports on development of photomultiplier tubes, 1245(R), 3464(R), 5410(R), 12107(R)

Du Pont de Nemours (E.I.) and Co. Experimental Station, Wilmington, Del.

progress reports, 11: 12466(R)

Du Pont de Nemours (E.I.) & Co. Savannah River Lab., Augusta, Ga.

progress reports on power reactor development, 11: 11407(R)

Dual-Temperature Process

operation of single stage tower for d_2 concentration, 11: 1788

Ductility

methods of measurement, 11: 6742

statistical analysis of effects of temperature and metal groups on, 11: 12048

Ducts
See Pipes; Reactor shield voids.

Dumontites

identity and conditions of deposition, chemical, optical, and x-ray data, 11: 1871(J)

Dunites

density at high pressures, shock wave effects, 11: 5364

Dusts

(See also Aerosols; Particles; Powders.)

detection, recording photometric particle-size analyzer for, 11: 1562

electrostatic separation from air, efficiency of mechanically charged fabric media, 11: 6322

particle size measurement, 11: 2243(R)

sampling equipment, 11: 6816

size measurements, 11: 12960(R)

turbulent diffusion and mixing in coal mines, tracer study, 11: 13318(J)

Dutch-Norwegian Heavy Water Reactor
See JEEP Reactor.

Duttonites

quadrivalent vanadium mineral, occurrence in Peanut Mine, Montrose Co., Colo., 11: 13328(J)

Dyes

(See also specific dyes, e.g., Toluidine blue; see also classes of dyes, e.g., Phenazine dyes and Thiazine dyes.)

efficiency of resorcinol as a thermostabilizing agent in chemical radiation detectors, 11: 12517(R)

physiological effects, 11: 13565(R)

testing Zyglo Fluorescent, penetrants, 11: 3397

Dynamics
See Mechanics.

Dysprosium

absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969

ferromagnetic-antiferromagnetic phase transitions, 11: 7210

heat of combustion, 11: 973(J)

Dysprosium (cont'd)

magnetic measurements and metallic phase transitions, 11: 8117(R)

physical and chemical properties, 11: 5816(J)

spectrographic determination, 11: 12973(R)

Dysprosium isotopes

alpha-emitters, discovery, 11: 3330(R)

neutron-deficient, 11: 4814(R)

nuclear properties of neutron-deficient, 11: 7091(R)

Dysprosium isotopes Dy^{157}

gamma spectra, formed in a spallation reaction, 11: 12941

Dysprosium isotopes Dy^{160}

radiation emission, 11: 1272

vibrational levels in, 11: 10785(J)

Dysprosium isotopes Dy^{161}

nuclear energy levels, 11: 1307(J)

nuclear spins and magnetic moments, 11: 616(J)

Dysprosium isotopes Dy^{163}

nuclear spins and magnetic moments, 11: 616(J)

Dysprosium isotopes Dy^{164}

internal conversion, 11: 11740(R)

Dysprosium oxides

crystallographic data for Dy_2O_3, 11: 1451

heat of formation, 11: 973(J)

sinterability at various temperatures in oxidizing and reducing conditions, 11: 970

thermal expansion coefficient from 30 to 840°C, 11: 7964

E

E.443 Reactor
See DIDO.

Eagle-Picher Research Labs., Joplin, Mo.

progress reports on fundamental studies of lead–oxygen system, 11: 413(R)

Earth

(See also Soils.)

age estimation, 11: 6360(J), 6361(J), 8001(J)

East Calhoun Mine (Colo.)

geology, mineralogy, and pitchblende occurrence, 11: 12045(J)

Eastern Highland Rim (Tenn.)

geophysical exploration, uranium distribution in Chattanooga shale in Youngs Bend Area in, 11: 3406

EBR
See Experimental Breeder Reactor.

EBWR
See Experimental Boiling Water Reactor.

Edgemont Quadrangle (S. Dak.)

geologic map of, 11: 3410(J)

Eggs

dehydration effects on radioinduced exchanges in oöcytes and oögonia, 11: 9922(J)

radiosensitivity of Habrobracon, effects of anoxia, 11: 5719(J)

Einsteinium

production in a cyclotron and nuclear properties, 11: 620(J)

Einsteinium isotopes

nuclear properties, 11: 13443

Einsteinium isotopes Es^{248}

discovery and properties, 11: 3033(J)

Einsteinium isotopes Es^{249}

discovery and properties, 11: 3034(J)

Einsteinium isotopes Es^{250}

discovery and properties, 11: 3034(J)

Einsteinium isotopes Es^{251}

discovery and properties, 11: 3034(J)

Einsteinium isotopes Es^{252}

discovery and properties, 11: 3034(J)

Einsteinium isotopes Es^{253}

spontaneous fission energy release, calculated, 11: 13444

Elasticity

constants in structural design applied to Ti, 11: 1135

of grain compacts and suspensions, 11: 3881(J)

modulus of metals, temperature dependence, 11: 342(J)

Elastomers

(See also Rubber.)

fluoro-silicone-, preparation, 11: 144(R)

formation by irradiation of polyvinyl methyl ether and properties, 11: 11919

properties of hypalon rubber, 11: 12016

properties of $1F^4$ fluororubber, 11: 12017

radiation damage to, as gaskets in Materials Testing Accelerator (Mark I) shielding, 11: 8744

radiation effects, 11: 1922(R), 5246, 5813, 6674, 7360, 8857, 12691, 12694

resistance to chemical attack by Dapex and Amex solutions, 11: 3359(R)

Electrets

polarization, temperature effects on, 11: 11264(J)

Electric arc furnaces

construction and operation of a laboratory scale, 11: 5339

design and performance of, for alloy melting, 11: 11674

design for consumable-electrode arc-melting Ti and Ti alloys, 11: 4872

design for fusing tantalum carbides, 11: 11231(J)

design for production of Ti shaped castings, 11: 2923

Electric arcs

(See also Electric probes; Perhapsatron; Stellarators; Thermonuclear reactions.)

alternating current, special conditions for, 11: 419(J)

design of hydrogen arc lamp, 11: 7368(J)

design of semi-automatic, for emission spectroscopy, 11: 3915(J)

effects of electric and magnetic fields, ionization, and ion motion in, 11: 2551

for high power outputs, 11: 12301(J)

investigation of high-current pulsed, 11: 10605(J)

shape and breadth of spectrum lines in, 11: 10606(J)

Electric arcs (cont'd)

spectrum excitation conditions in, stabilization, 11: 7370(J)

temperature measurements in the column of a Gerdien, 11: 12100(J)

Electric cells
See Photoelectric cells; Radioelectric cells.

Electric conductivity

(See also Resistors.)

of copper-gold alloys, variation with short-range order, 11: 368(J)

electrodeless measurement, 11: 5239(J)

equipment for measurement of velocity of ground waters, 11: 1220

measurement by eddy current method, 11: 6657

measurement with a-c alternating current, 1417(J)

methods of measurement, 11: 11073(J)

methods of measurement, equipment for, 11: 7178

methods of measurement of, in U, 11: 8246

short-range order effect on, of solid solutions, 11: 369(J)

temperature effects in high-vacuum, 11: 10105

theory of mixed, in solids, 11: 384

theory of multi-bond, 11: 10109

thermal fluctuations, 11: 5377(J)

Electric control systems

voltage divider for measurement of pulse voltages up to 2000 kv, 11: 1560(J)

Electric currents

equipment for measuring very small inductances, 11: 12114(J)

measurement of a-c in electrochemistry, 11: 1417(J)

production by cellophane – $BaSO_4$ membrane in H_2SO_4 and $Ba(OH)_2$, 11: 5192(J)

thermal fluctuations of, in conductors, 11: 5377(J)

transient, from plastic insulators, 11: 425

Electric discharge

analysis of ionic centrifuge type, 11: 5421

in argon, 11: 8064(J)

in argon, electron distribution function, 11: 8063(J)

breakdown of microwave gaseous, 11: 5369(R)

characteristics of microdischarge in vacuum, 11: 5394(J)

charge accumulation in thunderclouds, 11: 7232(J)

cleaning of glass and metal surfaces using, 11: 8059(J)

current contraction in fast and intense, mechanism, 11: 431(J)

data on, survey, 11: 6772

electrode pulverization and space potential in high-frequency, 11: 10141(J)

electron acceleration against an opposing electric field, 11: 5390

electron energy distribution in positive column discharge in Hg vapor, 11: 8052(J)

electron losses in, microwave studies, 11: 1555(J)

electron motion in plasma of glow and arc, effect of external inhomogeneous magnetic field on, 11: 8051(J)

gas density during, measurement with probes, 11: 8055(J)

gas discharge of a very strong current in a longitudinal magnetic field, 11: 11287(J)

gas oscillations in magnetic field, 11: 12782(J)

gaseous, instability of constricted, 11: 4522(J)

hydromagnetic instabilities of ideally conducting fluid, 11: 4521(J)

Electric discharge (cont'd)

in inert gases, investigation of instantaneous brightness, 11: 10604(J)

ion mobility and space charge in non-uniform fields, 11: 424(J)

live intensity distribution in sodium subordinate series in the positive column, 11: 10603(J)

mathematical analysis of electrodeless gas discharge, 11: 2558

measurements using 2 probes in high-frequency electrodeless, 11: 5934(J)

metal transfer in, 11: 13837(R)

microwave, coefficient of diffusion and frequency of ionization, 11: 9365(J)

oscillations in positive column in gaseous, 11: 8048(J)

partial high-frequency, through oiled-paper insulation, 11: 8047(J)

penetrating radiation from pulse, 11: 432(J)

pinch effect in, review of studies, 11: 7234(J)

pinched gas, cooled by bremsstrahlung radiation, equilibrium characteristics, 11: 4519(J)

plasma emission of a glow discharge in moist air, 11: 8053(J)

plasma pulse in cylinder, 11: 12781(J)

properties of pulse, at high currents, 11: 430(J)

space periodicity of gas, 11: 8049(J)

sparkling potential, 11: 10140(J)

spectra of high-frequency, in gases and in a flame at atmospheric pressure, 11: 10613(J)

spectral lines in, influence of atmospheric pressure on intensity of, 11: 420(J)

spectroscopic studies of pulse, in H, 11: 433(J)

temperature and radiation measurements on water-stabilized high pressure arcs, 11: 6773(J)

temperature measurement in spark discharges, 11: 6265(J)

theory, 11: 10135

theory of unipolar corona, 11: 8056(J)

thermonuclear reactions in, 11: 429(J)

x radiation accompanying, in gas, 11: 434(J)

Electric fields

(See also Magnetic fields.)

accelerating for FFAG accelerator, effect of radial position, 11: 3150

intensity, effect of weak ionization and space charge, 11: 1998(J)

measurement by glo-ball method, 11: 7874, 8731

Electric generators

evaluation of oscillating magnetic induction, fuel cell, solar battery, ion exchange membrane, and thermocouple as, 11: 9345

Electric insulators

development for liquid metal pumps, 11: 2892

for electromagnetic pump coils, electric conductivities, 11: 2475

materials for ultra high temperature miniaturized power transformers, 11: 12791(R), 12792(R), 12793(R)

plastic, transient electric currents from, 11: 425

plastic and inorganic, comparison, 11: 450(R)

properties of irradiated polymers, 11: 10465

radiation effects on, 11: 2219(J), 2754

thermal stability, method of measurement, 11: 2219(J)

for use in ionization chamber construction, radiation effects, 11: 2456

Electric meters

design for use as electromagnetic position indicator, 11: 11283

Electric power

direct generation of, from fission energy, 11: 13833

sources, unconventional, 11: 8974

world energy requirements, 11: 14(J)

Electric probes

characteristics at positive potentials and use in measurement of gas density during discharge, 11: 8055(J)

design for accelerator beam current measurement, 11: 7029(P)

Electric properties

equipment for measuring very small inductances, 11: 12114(J)

Electric resistance
See Electric conductivity.

Electricity

static, elimination with ion blower, 11: 13371(J)

time-temperature characteristics in electric contacts, 11: 3877(J)

Electrochemical corrosion

size effect, 11: 3816(J)

Electrochemistry

equipment for determination of transfer coefficients for electrochemical reactions, 11: 11911

of low valences of Ti, 11: 6229(R)

measuring methods using a-c in, 11: 1417(J)

methods for study of electrocapillarity, 11: 6415

theory of concentration polarization, 11: 12671(J)

voltages for heavy colored metals and their sulfides in fused alkaline metal chlorides, 11: 11925(J)

Electrochromatography

mechanism of 2-way, 3-way, and continuous, 11: 9578(R)

methods development, 11: 13577(R)

separation of U, Th, and Zr by, 11: 8267(R)

Electrodeionization

behavior of sheaths of positive ions around electrodes in, 11: 423(J)

Electrodeposition

of aluminum from hydride bath, 11: 1899(J)

colloidal systems in, ultramicroscopic observations in, 11: 341(J)

of metals from organic solutions, 11: 1898(J)

Electrodes

(See also Anodes; Carbon electrodes; Cathodes; Copper electrodes; Glass electrodes; Graphite electrodes; Platinum electrodes; Sodium electrodes; Tantalum electrodes; Zinc electrodes.)

arc melting of U with Mo, W, and graphite-tip, evaluation of, 11: 10843

chlorine, potential stability in molten chlorides, 11: 1416(J)

development of reference, for molten salts, 11: 10431(R), 10432(R), 10433(R), 10434(R)

kicker, effect on electrostatic field generation, 11: 3163

polarization by superposition of a-c on d-c, 11: 6423

pre-breakdown conduction between, in continuously pumped vacuum systems, 11: 4516(J)

preparation of, for Zr and Hf production, 11: 10899(R)

prevention of insulator leakage in, 11: 449(R)

testing accelerator, 11: 13837(R)

Electrodes (cont'd)

uranium dioxide, in molten chloride electrolyte, 11: 7158(J)

welding, of Cr–Mo–Ni, 11: 1537

Electrodynamics

kinetics, 11: 82(J)

of rotating media, 11: 5072

Electrolysis

(See also Electrodeposition.)

colloidal systems in, ultramicroscopic observations in, 11: 341(J)

of deuterium, design of equipment for, 11: 4546(J)

energy consumption analysis, 11: 12061(J)

flow of electrolytes during reduction at the dropping Hg electrode, 11: 11063(J)

of fluorides anode reactions, 11: 3722(J)

Electrolytes

(See also Nonelectrolytes.)

effects on physical properties of thorium oxide slurries, 11: 7415

energy consumption analysis, 11: 12061(J)

flow of, during reduction at the dropping Hg electrodes, 11: 11063(J)

one-dimensional compressible flows in, 11: 2424

recovery of Tl from, by ion exchange, 11: 6654

separation from nonelectrolytes by electrodialysis, 11: 11648

Electrolytic cells

(See also Electrochemical analysis; Electrodes; Electrochemical separation processes.)

for catalytic recombiner test loop, design, 11: 8708(R)

concentration polarization, theory, 11: 12671(J)

design, 11: 7686(R)

design and operation, 11: 6663

design for electroreduction of UO_3, 11: 7383

design for electrorefining Ti metal, 11: 4873

design for F production, 11: 2288

design for Th metal production, 11: 8533

design for Ti production from fused salts, 11: 5351(J), 11985(J)

design for U refining, 11: 7568(R)

design of quartz membrane, for electrochemical measurements, 11: 13580(R)

for determination of molar free energy of formation of metal halides and sulfides, 11: 6235

energy consumption in, 11: 12061(J)

potentials, effect of centrifugal and gravitational fields on, 11: 1767(J)

for recovery of U from oxalate solutions, 11: 5084(P)

transference numbers and function potentials in molten salt solutions, 11: 6652(J)

Electrolytic polishing

equipment for, U rod for tensile specimens, 11: 6991

of metals, 11: 2500

Electrolytic separation processes

for fission products, 11: 6679

ionic fractionating still for separation of ions of like charge, 11: 2581(R)

Electromagnetic fields

behavior of Dirac particles in, 11: 6032(J)

Electromagnetic fields (cont'd)
charged particles with ½ spin in, relativistic invariant equations for, 11: 10373(J)
circuits, application as position indicator, 11: 11283
components, use of Fourier method for obtaining expressions for, 11: 2210(J)
equations in rotating systems, derivation, 11: 5072
interaction with plasma, 11: 9354(J)
moving boundary problems in theory, 11: 5681
particle aspects of equations for, 11: 6177(J)
Electromagnetic lenses
focusing properties of quadrupole, 11: 4918
helical, characteristics of, 11: 12109
Electromagnetic pumps
bibliography on, 11: 6345
ceramic insulation for coils of, electric conductivities, 11: 2475
design and performance, 11: 1061, 2464, 5305(J)
design and performance for use in reactors, 11: 10068(J)
design and performance of d-c, 11: 2632(R)
design of single-phase liquid metal, 11: 11519(P)
evaluation for use at Hanford, 11: 4422
heat capacity of Experimental Breeder Reactor, 11: 11746(R)
operation and performance, 11: 2449
performance, effect of entrained gas and flow rate, 11: 13866(R)
performance in NaK circulation, 11: 10921(R)
performance testing, 11: 13149(R)
radiation effects (γ), 11: 2754
testing, pressure drop vs. flow characteristics of 85 psi, 11: 12450
testing of water coolant passages of 75 psi, 11: 12449
Electromagnetic separation
continuous beam scanning in, 11: 8077(J)
cooling system for baffles in Hg isotope separation, 11: 2582
design analysis of ionic centrifuge, 11: 5421
development of magneto-ionic, 11: 5422, 5423
efficiency, 11: 2870(J)
high-intensity isotope separator, design, 11: 6797(J)
of plutonium isotopes, equipment for, 11: 6452(J)
principles and equipment, 11: 202(J)
proceedings of conference at Harwell, September 1955, 11: 1569(J)
retention of inert gas isotopes, 11: 9378
Electromagnetic Separation Plant
(See also Calutrons.)
chemical recycle, closed-cylce beta process, 11: 12408
progress in research, 11: 9888(R)
uranium salvage, 11: 2375, 2583
Electromagnetic waves
(See also Gamma radiation; Infrared radiation; Radio waves; Ultraviolet radiation; X radiation.)
emitted from impact of H^+ ions on metal surfaces, 11: 3193(J)
interactions with charged particles, 11: 427(J)
interactions with electrons, role in superconductivity, 11: 9350(J)
multipole radiation equations, 11: 9444(J)
Electromagnetic waves (cont'd)
normal modes characterizing magneto-elastic plane, 11: 1189(J)
propagation along an infinite spiral crack, 11: 11265(J)
propagation in a gyrotropic layer, 11: 7379(J)
propagation in ionosphere, theory, 11: 7378(J)
propagation in plasma (ionosphere), 11: 9354(J)
spin, macroscopic measurement, 11: 12082(J)
theory of growing electric space-charge waves, 11: 1190(J)
Electromagnetism
of photons, nonlinear equations, 11: 10372(J)
Electrometallurgy
surface reactions of black and non-ferrous metals at elevated temperatures, 11: 3436(J)
Electrometers
automatic timer for, 11: 3921(J)
design considerations for radiation measurements, 11: 12139
small compact airborne system for γ radiation, 11: 1559
standardization, 11: 8283(R)
Electron beams
from betatron, applications in cancer therapy, 11: 61(J)
charge distribution in magnetic fields, apparatus for measuring, 11: 7245(J)
current integrator design, 11: 12124(J)
energy dissipation in Al, spatial distribution, 11: 6954(J)
Faraday-cup monitors for high-energy, description and design of, 11: 1598(J)
focusing, for killing bacteria, 11: 5709(P)
focusing theory, mathematical calculations, 11: 1210(J)
formation of high-density, 11: 3458(J)
industrial uses, 11: 8066(J)
ion oscillations in, 11: 8025(R)
nonlaminar flow in cylindrical, 11: 8965(J)
oscillations of interacting, theory, 11: 7376(J)
prebunching by velocity-modulation, 11: 1354
production of polarized, 11: 12769(J)
properties of neutralized relativistic, 11: 9343
radiolysis of hexane induced by exposure to, 11: 6676(J)
relativistic stabilized, 11: 3185(J)
ring currents, possibility of producing relativistic self-constricted, 11: 6776
spin kinematics for charged particles in a uniform magnetic field, 11: 8966(J)
Electron capture
in fluorine^{18}, 11: 2074(J)
probability studies, 11: 776(J)
radiative, in Cs^{131}, 11: 1380(J)
theory of K, with two photons, 11: 6873(J)
theory of radiative K, 11: 5519(J)
Electron-diffraction analysis
quartz fiber thickness measurements using, 11: 11331(J)
reflected electron effects on secondary electron emission, 11: 8067(J)
review of Russian achievements in, 11: 8046(J)
theory and experimental techniques, 11: 439(J)
Electron microscopes
accessories design, 11: 12960(R)

Electron microscopes (cont'd)

application for particle size measurements, 11: 12953

design and performance of emission, 11: 11304(J)

design of device for eliminating vibration, 11: 12961(R)

measurement of polarizability of metal ions with, 11: 393(J)

metal surfaces observed with, techniques, 11: 11304(J)

modifications and performance of direct light, 11: 11303(J)

performance, 11: 7695(R)

Electron microscopy

application of cathodic vacuum etching to, 11: 13823

metal surfaces observation techniques, 11: 11303(J)

sample preparation, 11: 6192(J), 7398(R), 9576(R), 12959(R)

sample preparation of magnesium oxide smokes, 11: 13264

studies of MnO_2 and BeO, 11: 12330(R)

use in study of Ti alloy structures, 11: 3853(R)

Electron multiplier tubes

(See also Photomultiplier tubes.)

design and performance in mass spectrometers, 11: 13298

Electron pairs

annihilation, radiative corrections to two quantum, 11: 6015(J)

annihilation in oriented graphite, angular correlation of radiation from, 11: 8125(J)

coincidence measurements, intermediate image spectrometer for, 11: 3973(J)

ionization from, 11: 571(J)

production, 11: 696(J)

Electron scattering cross sections

for excitation of hydrogen, variational calculation, 11: 8161(J)

in nuclear fields with pair creation, calculations, 11: 9079(J)

small calculations of high energy positrons and electrons, 11: 10168(J)

Electron showers

analysis of, associated with energetic He nucleus, 11: 1546(J)

number of electrons produced in single electron initiated, 11: 9369(J)

production by single 10^{12}-ev photon, analysis, 11: 5927(J)

Electron sources

(See also Beta sources.)

design of, for prebunching the electron beam by velocity modulation, 11: 1354

electron gun, testing, 11: 1383(R)

Electron tubes

(See also Diodes; Electron multiplier tubes.)

design and testing of magnetrons, 11: 12177(R)

design of harmonic generator magnetrons and stabilization of klystrons, 11: 4489(R)

design of high output, with accelerator grids, 11: 3916(J)

design of 7-cavity, stagger tuned, hollow-beam klystron, 11: 8025(R)

drive circuit for decade glow transfer counter tubes, 11: 3930(J)

electron emission characteristics, 11: 8025(R)

electron trajectories in cylindrical, differential equations of motion, 11: 1955(J)

feedback circuits applicable to grounded grid tube, 11: 5945

gain-phase characteristics of multi-cavity klystrons, 11: 5369(R)

gas-type, controlling by interaction between currents and plasma motions, 11: 10136

Electron tubes (cont'd)

magnetrons, testing for harmonic power output, 11: 1383(R)

oscillations in gas-discharge, 11: 8060(J)

performance of input, for low-noise preamplifier, 11: 6438

radiation effects, 11: 8215

reliability, 11: 3911

space charge effects in beam type magnetrons, theory, 11: 7246(J)

stability of klystron for atomic beam emission spectrometer, 11: 1383(R)

traveling wave magnetron amplifier characteristics, 11: 6129

tuneable cavity for klystron, 11: 5944

Electronic equipment

adapter assembly system design, 11: 7241

amplifier design to prevent overcharging of interstage coupling capacitors by strong signals, 11: 3262(P)

analysis by Boolean Algebra, 11: 13380

for Argonne synchrotron, 11: 8199(R)

bibliography of radiation effects on, 11: 12289

calibration, for combined counting and analysis of size distribution of animal cells, 11: 7910(R)

catalog of, 11: 6784

cooling by air, liquid, and evaporation in miniaturized, 11: 1034

cooling by conduction and radiation, tests on, 11: 3904

design for diffusion length measurements in graphite, 11: 499(J)

design of a nickel depth meter, 11: 1558

flexible laminated printed circuits for, 11: 10107

ion beam chopper for time-of-flight measurements, design, 11: 2962

linear gate of 200 mμ sec duration, 11: 4949(J)

operation of differential and integral discriminators, 11: 12339(R)

pulse-height analyzer, design of multichannel, frequency modulated, 11: 3920(J)

phase meter for either amplitude modulated or frequency modulated phase measurements, 11: 3265(P)

radiation effects, 11: 2181, 6148, 6149, 8215

radiation effects on components and systems, 11: 11472

radiation effects on ignition exciter, 11: 11469

radiofrequency synchronizer for cyclotrons, 11: 3258(P)

relay for protecting equipment in a r–f line from overloading, 11: 3252(P)

reliability, 11: 3911

replacement of tubes with gas tubes controlled by current interactions and plasma motions, 11: 10136

scanner for nuclear emulsions, 11: 1996(J)

survey of, for nuclear physics measurements, 11: 464(J)

temperature control for a proportioning furnace, 11: 1027

time interval measuring device for high precisions, design, 11: 2564

for time selector calibration, design, 11: 466(J)

transistor applications in nucleonics, 11: 2961

Electronics

(See also Circuits; Computers; Radiation detection instruments; Radiation detectors.)

applications at the French Atomic Energy Commission, 11: 6788(J)

techniques for nuclear physics, 11: 6505(J)

Electrons

(See also Beta particles; Auger electrons; Conversion electrons; Cosmic electrons; Electron pairs; Leptons; Positrons.)

Electrons (cont'd)
angular distribution in electron-photon cascades, 11: 1284(J)
angular distribution of Compton, 11: 8964(J)
anomalous magnetic moment of, method of calculating, 11: 10144(J)
backscattering, study with spectrometer with double focalization, 11: 10608(J)
capture by protons passing through H, 11: 5060(J)
capture in betatrons, 11: 8201(J), 12920(J)
cascade showers produced by, in light and heavy elements, 11: 4627(J)
chemical effects on BrF_3, 11: 8321
correlation energy of electron gas at high density, 11: 6985(J), 6986(J)
Coulomb interactions and diamagnetism, 11: 5400(J), 13372(J)
Coulomb scattering by point nuclei of relativistic, 11: 1681(J)
cross sections for direct pair production by, 11: 3513(J), 3518(J)
density in toluidine, methods for computing, 11: 6003(J)
diffraction between 0.5 and 1 Mev, 11: 3181(J)
distribution function for, in plasma, 11: 8049(J)
distribution function in impulse discharge in argon, 11: 8063(J)
drift velocity in gases, 11: 4916(J), 7291(R)
effects of irradiation with, on properties of Cu, 11: 2187(J), 4743(J)
effects on glucose solutions, 11: 5814(J)
ejection from L-subshells by protons, form factor for, 11: 12103(J)
elastic scattering, 11: 6948(J)
elastic scattering by electrons and positrons, radiative corrections, 11: 12786(J)
elastic scattering by point nuclei, calculations of Mott cross sections, 11: 744(J)
elastic scattering of low-energy by atomic N and O, 11: 5654(J)
elastic scattering in H, 11: 4737(J), 13470(J)
electron-electron and ion-electron effective cross-sections in plasmas, 11: 10690(J)
emission of secondary, from metals bombarded by ions and neutral particles, 11: 1209(J)
emitted by C^{12} nuclei during monopolar o-o transition, 11: 10253(J)
energy distribution of fast, in positive column discharge in Hg vapor, 11: 8052(J)
energy levels for spin $\frac{1}{2}$, in coulomb field, 11: 10790(J)
energy loss and range in materials, 11: 745(J), 4152(J), 4914
energy loss of slow, in nitrogen, 11: 13373(J)
flux to produce 1 mrep of dose, calculation, 11: 1946
formation of secondary slow, on metal and film-coated metal surfaces, 11: 3455(J)
high-energy kinematics of, data on, 11: 6867
high-energy scattering from nuclei, proton correlations effect, 11: 9083(J)
inelastic scattering by C^{12} nucleus, 11: 1305(J)
inelastic scattering by nuclei, theory, 11: 10339(J)
inelastic scattering from copper oxide, 11: 441(J)
interaction potential of 2 spinor particles, calculation by relativistic quantum electrodynamics, 11: 2218(J)
interaction with vibrations of crystalline lattice, 11: 442(J)
interaction theory, 11: 9368(J)
interactions (neutrons), 11: 13482(J)
interactions between, 11: 5401(J)
interactions with waves, role in superconductivity, 11: 9350(J)
ionization at origin of high-energy electron-position pairs, 11: 10337(J)
ionization by, 11: 3479(R)

Electrons (cont'd)
K-capture, wave function coefficients, 11: 8065(J)
K capture to positron branching ratios, 11: 10610(J)
lateral diffusion of swarm of, moving through a gas in a magnetic field, 11: 5399(J)
magnetic dipole moment, 11: 10712(J)
magnetic moment, 11: 10142(J)
mass variation with velocity, review of experimental evidence, 11: 10143(J)
meson production by, differential cross section, 11: 531(J)
model, 11: 12784(J)
motion in cyclic accelerators, stochastic theory of, 11: 1556(J)
motion in plasmas of glow and arc discharges, effect of external inhomogeneous magnetic field on, 11: 8051(J)
multiple scattering by Al, Ag, and Au at 0.4 Mev, 11: 5398(J)
multiple scattering of 2.4-Mev, in nuclear emulsions, 11: 3190(J)
nuclear excitation by, 11: 4963(J)
nuclear scattering of high-energy, on independent-particle model, 11: 757(J)
optical emission, angular distribution of intensity and polarization in synchrotron, 11: 3454(J)
oscillation properties of gas, 11: 7229(J)
oscillations in synchrotron, method of measuring, 11: 12919(J)
pair production cross sections, 11: 3509, 4026(J)
parity and polarization of, from Co^{60}, 11: 7235(J)
penetration of γ-ray secondary, theory, 11: 4014
photo, emission from complex photocathodes bombarded by, 11: 3456(J)
pion production by inelastic scattering of, in H, 11: 4598(J)
plasma losses by fast, in thin films, 11: 9367(J)
plasma of, oscillations, 11: 8050(J)
polarization in beta decay, 11: 11291(J), 12293(J)
polarization in muon decay and two-component neutrino, theory, 11: 9424(J)
polarization of Sr^{89}-emitted, 11: 10355(J)
radiation capture or orbital, theory, 11: 576(J)
radiation effects on oscillations in strong-focusing synchrotrons, 11: 1208(J)
radiation emitted by, moving uniformly in a plasma in a magnetic field, 11: 6433(J)
radiative collisions with H_2O molecules, abnormal rotation in, 11: 1211(J)
range-energy and range-momentum curves, 11: 12281
range-energy relation in nuclear emulsion, 11: 6133(J)
recoil, production by passage of mesons(μ) through Fe and Pb, 11: 5937(J)
reflection from MoO_2 surface, energy losses, 11: 4524(J)
reflection from pure W and W covered by thin films, 11: 1953(J)
relativistic motion in magnetic fields, quantum effects, 11: 438(J)
role of spin in radiation from, quantum theory, 11: 12946(J)
scattering, and analytical representation of Hartree potentials, 11: 3188(J)
scattering, dispersion contribution to high-energy deuteron-, 11: 1686(J)
scattering, higher order radiative corrections to, 11: 5062(J)
scattering, probability of finding an ordinate to a point on the chord of ionization track arc, 11: 7274(J)
scattering by Ag, Pt, and U nuclei, 11: 756(J)
scattering by deuterons, 11: 4732(J)
scattering by deuterons, dispersion contribution to high-energy, 11: 1686(J)

Electrons (cont'd)

scattering by nuclei, 11: 1364(J)

scattering by point nuclei, calculations of Mott cross sections, 11: 744(J)

scattering by protons, 11: 2172(J)

scattering by protons, proton polarizability correction to, 11: 6957(J)

scattering by H_2, variational methods applied to, 11: 1367(J)

scattering by magnetic fields, 11: 8541(R)

scattering by 2p-shell nuclei, 11: 6560(J)

scattering from C^{12} at 187 Mev, 11: 613(J)

scattering from deuterons at high energies, exchange current contributions, 11: 578(J)

scattering from neighboring nuclei, 11: 2159

scattering from nonspherical nuclei, 11: 10262(J)

scattering from protons, absolute cross section, 11: 3194(J)

scattering in liquids, 11: 3901(J)

scattering information on electromagnetic structure, 11: 9082(J)

scattering of fast, by polarized nuclei, 11: 8968(J)

scattering of high-energy, by electrons, 11: 1952(J)

scattering of high-energy, by nuclei, 11: 6560(J), 6563

scattering of high energy, in lead, 11: 11266(J)

scattering of 139.5-Mev, by protons, measurement of radiative correction to, 11: 5061(J)

scattering of 187-Mev, by C^{12} and nuclear density distribution, 11: 2165(J)

scattering of relativistic, by point nuclei, 11: 1681(J)

scattering of 250-Mev photons by free, 11: 2179(J)

scattering of 20-kev, by foils of C, Al, Ni, Au, Formvar, and Al_2O_3, 11: 440(J)

scattering on electrons, 11: 12783

scattering theory, 11: 6948(J)

scintillation response of anthracene crystals to 6- to 30-kev, 11: 518(J)

secondary, in gases, device for study, 11: 5402

secondary emission, effects of reflected electrons, 11: 8067(J)

shell structure, atom relationship effects on, 11: 8036(J)

spin magnetic resonance of, theory, experiments, and bibliography, 11: 3009

stability of motion in cyclic accelerators including quantum effects, 11: 5646(J)

states in an electromagnetic field, 11: 3457(J)

structure, linear theory, 11: 10609(J)

temperature determination by probe methods, 11: 8245(J)

theory of luminous, 11: 3185(J)

thermal scattering of moderately bound metallic, modified deformable potential for, 11: 4523(J)

thermodynamic properties of mixtures of light nuclei and, in field of heavy nucleus, 11: 549

trajectories in cylindrical magnetron, differential equations of, 11: 1955(J)

transformation properties of electron-positron field amplitudes, 11: 12787(J)

velocity distribution, electrostatic analyzer measurements, 11: 9408(J)

velocity distribution function of, for variable electric and constant magnetic field, 11: 436(J)

Electrophoresis

preparation of metallic coatings by, 11: 8514(R)

Electroplating

by electrokinetic process, 11: 13093(R)

preparation of metallic coatings by electrophoretic deposition, 11: 8514(R)

of titanium coatings on metals and ceramics, 11: 12746

Electrostatic analyzers

charged particle beam measurements, 11: 10367(J)

design and performance, 11: 9408(J)

design and theory, 11: 4614(R)

for proton energies below 300 kev, 11: 8117(R)

Electrostatic fields

generation, effect of kicker electrodes on, 11: 3163

investigation of external, with Geiger-Mueller tubes, 11: 12159(J)

Electrostatic generators

(See also Van de Graaff accelerators.)

electron loading, device for preventing, 11: 3251(P)

high-voltage, design enclosed in compressed gas, 11: 9548(P)

Electrostatic lenses

characteristics of diverging, for accelerators, 11: 4138(J)

electron velocity distribution, measurements, 11: 9408(J)

Electrostatic precipitators

design and performance, 11: 11077

design for B separation, 11: 12332(R)

design for radiochemical plants, 11: 11042(J)

efficiency for air cleaning, 11: 3886(R)

performance, 11: 2243(R)

performance, for sampling stratospheric air, 11: 1263

performance for Na aerosol removal, 11: 3885

performance in separation of sub-micron particles, 11: 4780

sliding and laminar flow, for aerosol separation, 11: 8037(R)

Electrostatic separation

theory, 11: 6322

Elementary particles

(See also specific particles, e.g., Mesons; V particles.)

asymmetries of angular distributions of, from pion-nucleon and nucleon-nucleon collisions, 11: 1615(J)

behavior of Dirac, in external electromagnetic fields, 11: 6032(J)

Bethe-Salpeter equations for interactions, 11: 1625(J)

bremsstrahlung from neutral, vector, with anomalous magnetic moment, 11: 6871(J)

charged, theory, 11: 1286(J)

cross sections of neutral, energy dependence near threshold, 11: 6979(J)

energy and identification of delta particles, 11: 1197

equations for 3-dimensional extended, 11: 4760(J)

Fermi decay of higher spin, 11: 6982(J)

Elementary particles (cont'd)

chirality of spin ½, with finite mass, 11: 12189(J)

high-energy, All-Union Conference on, Moscow, 1956, 11: 10769(J)

high-energy kinematics of, data on, 11: 6867

interaction coupling constants, restrictions on, 11: 4191(J)

interaction Lagrangian for strong reactions of, 11: 1624(J)

interaction strength and parity non-conservation, 11: 9062(J)

interference phenomena between parity doublets, 11: 1632(J)

intrinsic moments, 11: 1631(J)

isomerism, 11: 12192(J)

kinematic properties of system of 2 Dirac, 11: 4958(J)

mathematical formulation of the Gell-Mann-Nishijima scheme for new, 11: 13560(J)

multiple production from nucleon collisions, hydrodynamical aspect of quantum theory of fields, 11: 12190(J)

multiple production in high-energy reactions, hydrodynamic theory, 11: 5699(J)

polarization method of measuring velocities of, with intrinsic magnetic moment, 11: 12944(J)

properties and physics of, 11: 3880(J), 6013(J)

quantum field theory, 11: 3629(J)

relativistic invariant equations for, with spin ½, 11: 10373(J)

relativistic wave equation for, with two mass states of spin 1 and 0, 11: 4196(J)

scattering, determination of, intermediate system formed, 11: 4149(J)

scattering by an extended potential, dispersion relations, 11: 5658(J)

scattering in nuclear emulsions, measurement with Klausen micrometer, 11: 9015(J)

scattering of high-energy Dirac and Klein-Gordon, 11: 1634(J)

statistical theory in multiple formation of, at 1 to 5 Bev, 11: 11356(J)

symmetries in interactions, 11: 8120(J)

theoretical interpretation of new, conferences on, 11: 6506(J)

theory, 11: 11354(J)

theory of, dynamically deformable form factors, 11: 564(J)

transformations of equations for, with high spin, 11: 10791(J)

unitary model of, numerical analysis, 11: 3511(J)

Elements

(See also Actinides; Alkali metals; Alkaline earth metals; Platinum metals; Rare earths; Transplutonic elements; Transuranic elements.)

antiproton cross sections, 11: 4615(R), 6868(R)

atomic masses in region from Fe to Zn, 11: 1303(J)

atomic weight computations, 11: 4316

average neutron total cross sections of heavy, at low energy, 11: 4651(J)

cascade showers produced by electrons and photons in light and heavy, 11: 4627(J)

distribution in normal human tissue, 11: 6595

formation in stellar explosions, mechanisms, 11: 1278(R)

free energy functions for gaseous, tables of, 11: 12106(J)

gamma reactions (γ,n), 11: 8193(J)

gamma scattering from bound electrons of heavy, 11: 8211(J)

genesis, in stars, 11: 1196(J), 2027(R)

genesis in supernova explosions, 11: 1935(J)

internal conversion coefficients for low-Z, corrections, 11: 3036(J)

Elements (cont'd)

neutron and x-ray absorption, 11: 256(J)

neutron capture cross sections of Mn, Zr, Ag, In, Sm, Eu, Gd, and Dy measured with Dimple oscillator, 11: 7309

neutron cross sections, 11: 8137

neutron cross sections and reactivity changes in Zephyr from insertion of samples of various, 11: 4660

neutron cross sections at 14.5 Mev, 11: 5559(J)

neutron scattering cross section data, analysis, 11: 7285

nuclear size by potential-scattering cross sections, 11: 10229

proton inelastic scattering at 23 Mev by heavy, 11: 6141(J)

radioactivity induced in Si, Cr, Mn, Fe, Co, Ni, Zr, Mo, Ta, Ti, and Sr in the Homogeneous Reactor Test, 11: 9821

thermodynamic properties of 54, considered as ideal monatomic gases, 11: 5368

Eleostearic acid

preparation, 11: 13565(R)

tissue distribution, 11: 13565(R)

Eleostearic acid, methyl ester

synthesis, tissue distribution, and toxic effects in mice, 11: 12959(R)

Embryos

(See also Fetuses.)

blood constituents during development, 11: 11939(J), 12960(R)

radiation effects on vertebrate, review, 11: 5145(J)

radioinduced abnormalities in developing, 11: 1735(J), 7917(J), 9917(J), 10408(J), 12959(R)

radiosensitivity, as demonstrated by late effects on children exposed in utero to the Hiroshima atomic bomb, 11: 36(J)

Emery Quadrangle (Utah)

photogeologic map, 11: 1094(J)

Emission spectra

gases, effects of composition, pressure, and spark gap, 11: 10612(J)

theory of, for gases, 11: 4525

Emissivity

equipment for measuring, 11: 6421

of spectral lines of metal vapors in a flame, 11: 795(J)

Emmett Wash NE Quadrangle (Ariz.)

photogeologic map, 11: 1107(J)

Emmet Wash Quadrangle (Ariz.)

photogeologic map, 11: 1109(J)

Emulsions

(See also Nuclear emulsions; Photographic emulsions.)

proton range energy measurements in, 11: 1182

settling characteristics of, 11: 13580(R)

stability in ultrasonic liquid-liquid extraction, 11: 185(R)

Engineering Test Reactor

buildings and facilities, 11: 651

charge life, method of estimating, 11: 9052(R)

control element design, 11: 13430(R)

control system diagram, 11: 13430(R)

critical facility hazards summary, 11: 6895

Engineering Test Reactor (cont'd)

criticality studies, 11: 13430(R)

design, 11: 651, 5610(J), 5611(J), 5612(J)

fuel element analysis for B content, 11: 7807, 13926

fuel elements, 11: 1276(R)

heat transfer, calculated surface temperatures for nuclear systems and analysis of uncertainties, 11: 11412

loading and reactivity, 11: 12888(R)

operational considerations, evaluation, 11: 651

reactivity effects of moderator voids, 11: 9052(R)

England

radiological dose due to fall-out from nuclear explosions calculated for inhabitants, 11: 3295

Eniwetok Atoll

environs monitoring following Operation Castle, March, 1954, 11: 12638(J)

environs monitoring following Operation Redwing, 11: 5965

Enriched reactors

(See also specific reactors using enriched fuel, e.g., Argonne Research Reactor.)

criticality studies, 11: 13147

design for research and isotope production, 11: 12528

design of Westinghouse Testing Reactor, 11: 1670(J)

fuel costs for homogeneous water-moderated, 11: 1668(J)

heat transfer and exponential measurements, 11: 7709(R)

neutron flux calculations for, approximate spatially separable, 11: 10300

Entropy

and nuclear spin, isotopic mixtures, configuration, H_2 and D_2, 11: 4496(J)

of solid and liquid metals, 11: 6744(J)

Enzymes

catalase and uricase association in rat and mouse liver, 11: 7910(R)

effects of irradiation, on activity, 11: 23(J), 2788(J), 3274(J), 4226(R), 5717(J), 7915(J), 7916(J), 8788(J), 9915(R), 9924(J), 10396

formation of co-factors, 11: 7910(R)

liver levels of catalase and uricase, effects of 3-amino-1,2,4-triazole, 11: 12642(R)

preparation of carboxydismutase, 11: 7091(R)

reaction mechanisms, tracer studies, 11: 17(J), 2817(J)

sulfhydryl, effects of S, β-aminoethylisothiuronium dichloride and β-mercaptoethylamine, 11: 9915(R)

Epithelium

(See also Skin.)

corneal, x-radiation effects, 11: 2784(J), 11854(J)

Equation of state

of alkali metal halides at high pressure, theory, 11: 13361

for gases and liquids, 11: 6633

involving critical ratio, 11: 10908

Thomas-Fermi, of very dilute gases, graphs, 11: 6975

Equipment and procedures

(For equipment pertinent to a specific process see also that process; see also direct entries for equipment units, e.g., Pumps and Valves; see also Counting devices; Distillation apparatus; Drying apparatus; Electronic equipment; Extraction apparatus; Laboratory equipment; Melting point apparatus; Remote-control equipment; Television equipment; Thermal cycling apparatus; Titration equipment; Water purification equipment; X-ray equipment.)

auxiliary devices for radiochemical experiments, 11: 1798(J)

reliability estimates on equipment or components, 11: 5957

Erbium

absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969

heat of combustion at 25°C, 11: 1473

ion exchange using ENTA, 11: 6302(J)

metallic phase transitions, 11: 8117(R)

physical and chemical properties, 11: 5816(J)

Erbium compounds

neutron-diffraction analysis, 11: 4016(R)

Erbium isotopes

isomeric transitions, 11: 9518(J)

Erbium isotopes Er^{161}

half life, 11: 13114(R)

Erbium isotopes Er^{163}

half life, 11: 13114(R)

Erbium isotopes Er^{169}

lifetimes, determination by method of delayed coincidences, 11: 8227(J)

Erbium isotopes Er^{167}

isomeric transitions, 11: 10363(J)

Erbium isotopes Er^{169}

isomeric transitions, 11: 10363(J)

Erbium isotopes Er^{171}

decay properties, 11: 4045(J)

gamma emission, coincidence studies, 11: 2191(J)

Erbium oxides

crystallographic data for Er_2O_3, 11: 1451

electrophoretic deposition for preparing β-ray spectrometer sources, 11: 3622(J)

heat of formation at 25°C, 11: 1473

Erythrocytes

iron incorporation by, effects of gamma dose rate, tracer study in rats, 11: 5138

life spans of human, tracer study, 11: 5136(R)

radiation effects on cholinesterase levels in rats, 11: 1727(J)

radiosensitivity, 11: 1400, 4231(J), 12960(R)

Erythropoiesis

age factors in rats, 11: 898

stimulating factors isolated from blood plasma, 11: 830(R)

Escherichia coli

biochemical effects of endotoxin on mice, effects of total body x-irradiation, 11: 11865(J)

desoxyribonucleic acid synthesis in, restoration after radioinduced block, 11: 881(J)

inactivation by organic peroxide and ultraviolet radiation, 11: 11030(J)

Escherichia coli (cont'd)
mutant induction, 11: 12642(R)
mutations induced by drugs, 11: 4781(R)
radioinduced release of cellular constituents by, 11: 7050(J)
radiosensitivity, effects of oxygen tension, 11: 883(J)
radiosensitivity of, effects of potassium cyanide and carbon monoxide on, 11: 10402(J)
Esso Research and Engineering Co., Linden, N. J.
progress reports on radiation resistant turbine engine lubricants, 11: 11959(R)
Esters
radiation effects, theory of network formation in poly-, 11: 13285(J)
Estrogens
tumors in mice induced by, 11: 840(J)
Ethane
ion pair production by β particles, absolute energy for, 11: 12764(J)
solubility in biphenyl, isopropyl- at atmospheric pressure and temperatures to 125°C, 11: 5406
Ethane, bromo-
electron impact studies, 11: 3740(J)
photolysis, isotope effect of C^{13} in, 11: 5806(J)
Szilard-Chalmers reaction, 11: 6244(J)
Ethane, chloro-
electron impact studies, 11: 3740(J)
Ethane 1,2-dibromo-
Szilard-Chalmers reaction in ethylene dibromide, 11: 6245(J)
Ethane, 1,2-dichloro-1,1,2,2,-tetrafluoro-
boiling heat transfer coefficients as a function of temperature, 11: 2433
Ethane, iodo-
electron impact studies, 11: 3740(J)
1,2-Ethanediol, 1,2-diphenyl-1-p-tolyl-
pinacol rearrangements, 11: 8286(R)
1,2-Ethanediol, triphenyl-
pinacol rearrangements, 11: 8286(R)
rearrangement, kinetics, 11: 11576(R)
Ethanethiol, 2-amino-
effects on bone deposition of P^{32} in young mice, 11: 11907(J)
protective effects against radiation injuries, 11: 879(J), 1756(J), 3309(J), 4253(J), 4797(J), 5176(J), 5742(J), 7071(J), 8796(J), 9204(J), 10417(J)
Ethanol
adsorption on Hg, 11: 1010(J)
bubble growths in superheated, 11: 5763
chromatographic separation and identification, 11: 6297(J)
effects of x rays (200 kv) in aqueous solution, 11: 6284(J)
radiation effects, preparation of stable free radicals, 11: 7132(J)
radiation effects on optical properties, 11: 1805
radiolysis and mass spectrometry of deuterated, 11: 5225(J)
solvent properties for $Pu(NO_3)_4$, 11: 4384
thermal conductivity from 2 to 82°C, 11: 1855(J)
Ethanol, 2,2',2"-nitrilotri-
reactions with $B(OH)_3$, 11: 4379
Ethanol, triphenyl-
molecular rearrangements, 11: 9587(R)
Ether, bis(2-butoxyethyl)
infrared absorption analysis, 11: 11119
infrared spectra, 11: 10485
reaction of fission product I_2 with, 11: 4357
solvent properties for $Pu(NO_3)_4$ and $Pu(NO_3)_6$, 11: 4382
solvent properties for U in ore solutions, 11: 11570
Ether, bis(2-chloroethyl)
hydrolysis in acids, 11: 12186(R)
solvent for extraction of various anions, 11: 1542(R)
Ethers
(See also specific ethers, e.g., Ethyl ether; see also Fluoroethers.)
development and properties for engine lubricant, 11: 11156(R)
infrared spectra of 2-butyoxyethyl vinyl, 11: 10485
irradiation of polyvinyl methyl ether to form elastomers, 11: 11919
radiation effects, 11: 12984, 12985
synthesis and physical properties of aromatic, 11: 3370(R)
Ethyl ether
solvent properties for $UO_2(NO_3)_2$ from aqueous solutions, 11: 2345, 13632
solvent properties for U in ore solutions, 11: 11570
Ethyl ether–boron hydride systems
See Boron hydride–ethyl ether systems.
Ethyl ether complexes
chemical determination of BF_3-containing, 11: 9533(P)
Ethyl ether–uranyl nitrate–water systems
solvent properties, 11: 11645
Ethyl phosphates
properties as refrigerant in Homogeneous Reactor Test secondary refrigeration system, 11: 3786
Ethylamine, 2,2'-dithio-bis-
protective effects against radiation injuries, 11: 879(J), 1756(J), 4253, 4797(J), 7071(J), 8796(J)
Ethylamine, 1,2,2-triphenyl-
deamination with nitrous acid, 11: 958(J)
Ethylene
decomposition of, and deuterated mixtures in electric discharge, 11: 5199(J)
electron drift velocity in, 11: 4916(J)
exchange and hydrogenation between deuterium and, 11: 3719(J)
ion pair production by β particles, absolute energy for, 11: 12764(J)
Ethylene, 1-chloro-1-fluoro-
Raman spectrum of gaseous, 11: 9243(J)
Ethylene, chloro- polymers
radiation effects, 11: 4346(J), 5246
Ethylene, chlorotrifluoro- polymers
high-temperature properties, 11: 5765
radiation effects, 11: 7885, 8742
range of α particles in, 11: 3028
tensile properties, effect of UF_6 absorption, 11: 13591
Ethylene, 1-dibromo-2,2-difluoro-
infrared spectrum and Raman spectrum, 11: 9242(J)

Ethylene, difluoro-

microwave spectra and molecular structure of deuterium labeled, 11: 8830(J)

Ethylene glycol

cleaning properties for Na in Submarine Intermediate Reactor heat transfer system, evaluation, 11: 2442

Ethylene oxide

acid-catalyzed hydrolysis of derivatives, kinetics, 11: 2820(J)

hydrolysis in D_2O-H_2O systems, 11: 1453

Ethylene polymer coatings

development of Teflon, for metals, 11: 258

Ethylene polymers

cyclization in gamma irradiated high-density, 11: 12689(J)

effects of radiation and of hot, pressurized water, 11: 1804

gamma absorption, 11: 2162

gamma radiation effects, determination by infrared analysis, 11: 6675

mechanical properties, 11: 3726(J)

nuclear magnetic relaxation in, 11: 10021(J)

permeability to chemicals and reagents, radiation effects, 11: 1413(R), 1414(R)

post-irradiation oxidation, 11: 965(J)

radiation damage to mechanical properties, method of measurement, 11: 12929

radiation effects, 11: 5246, 7885

radiation effects on melting behavior, 11: 4351(J)

stability to oxidation up to 210°C, 11: 10807

for use in ionization chamber construction, radiation effects, 11: 2456

vacuum forming, 11: 4850

Ethylene, tetrachloro-

uses in chemical dosimeters, 11: 505(J)

Ethylene, tetrafluoro- polymers

fabrication for critical experiment fuel elements, 11: 3062

high-temperature properties, 11: 5765

lubricity and use as coating for ordnance material, 11: 258

mechanical properties, 11: 3726(J)

nuclear magnetic relaxation in, 11: 10021(J)

for protection of fuel element mockups during heat transfer testing, 11: 3815

radiation effects (γ), 11: 2299

radiation effects on Fluoroflex Teflon tubing, 11: 3796

radiation effects on Redox solutions, 11: 7459

testing as lubricant for bearings, 11: 2453

treatment with radiation to lower molding temperature, 11: 8249(P)

Ethylene, trichloro-

detergent properties for degreasing U, 11: 8414

reduction of UF_6 to UF_4 by, 11: 12715

reactivity with uranium in degreasing, 11: 8407

Ethylenediamine

electrochemical properties of $ThCl_4$ dissolved in, 11: 8835(J)

solubilities and conductances of rare earths in, 11: 11118(J)

Ethylenediaminetetraacetic acid

See Acetic acid (ethylenediamine)tetra-.

ETR

See Engineering Test Reactor.

European Organization for Nuclear Research, Geneva.

progress reports, 11: 11255(R)

Europium

absorption from HCl by ZrO_2 and $Zr_3(PO)^4$, 11: 7859(R)

activation state in phosphors, 11: 12145(J)

effect on luminescence of $LaCl_3$ single crystals, 11: 2852(J)

neutron activation determination in LiI, 11: 11586(R)

nuclear magnetic resonance, 11: 4752(J)

paramagnetic resonance in divalent, fine and superfine structure, 11: 4749(J)

physical and chemical properties, 11: 5816(J)

polarographic determination in lithium iodide, 11: 8285(R)

preparation and physical properties, 11: 4810(R)

properties for reactor control rods, 11: 3617(J)

separation from rare earth oxides by carbon reduction and distillation, 11: 10030(J)

separation from U by organic coprecipitation, 11: 9265(J)

separation from Y, 11: 8282(R)

solubility in liquid NH_3, 11: 1474

solvent partition between $Th(NO_3)_4-HNO_3$ and TBP, 11: 10811(R)

solvent partition in TBP, 11: 10812(R)

solvent partition of trace amounts during solvent extraction of Th, 11: 8289(R)

Europium chlorides

absorption and fluorescence spectra in H_2O, CH_3OH and C_2H_5OH, 11: 3746(J)

Europium compounds

preparation, crystal structure, and properties of EuN, 11: 1470

Europium ethyl sulfates

Zeeman effect and crystal structure of hexagonal, 11: 13553(J)

Europium isotopes

beta spectrum from Eu^{152} and Eu^{154} mixtures, internal conversion lines in, 11: 4173(J)

decay schemes, 11: 12339(R)

neutron resonance parameters of Eu^{151} and Eu^{153} and Eu oxide transmission, 11: 10229

Europium isotopes Eu^{145}

gamma spectra, formed in a spallation reaction, 11: 12941

Europium isotopes Eu^{147}

alpha activity, 11: 2254(R)

conversion electron spectrum relative intensities, transitions, 11: 2968

gamma spectra, formed in a spallation reaction, 11: 12941

Europium isotopes Eu^{149}

conversion electron spectrum relative intensities, transitions, 11: 2968

Europium isotopes Eu^{151}

Coulomb excitation, 11: 10360(J)

low-lying energy levels, 11: 10361(J)

neutron resonance parameters, 11: 4016(R)

Europium isotopes Eu^{152}

decay schemes, 11: 1567(J), 4175(J), 6054(J), 6863(R), 8227(J), 10784(J)

nuclear spin and magnetic moment, 11: 6515(J)

Europium isotopes Eu^{153}

Coulomb excitation, 11: 10360(J)

energy received from decay of Sm^{153} and Gd^{153}, 11: 775(J)

excited levels of, half lives, 11: 2062(J)

internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

neutron resonance parameters, 11: 4016(R)

Europium isotopes Eu^{154}

decay schemes, 11: 4814(R), 6054(J), 8227(J), 8999, 9054(R), 10231(R), 10784(J)

Europium isotopes Eu^{155}

decay schemes, 11: 4814(R), 7078(J), 8999, 11740(R)

use in medical radiography, 11: 7078(J)

Europium isotopes Eu^{156}

gamma emission, 11: 9054(R)

Europium oxide–chromium–iron–nickel systems
See Chromium–europium oxide–iron–nickel systems.

Europium oxide–stainless steel systems

extrusion, 11: 7328(R)

Europium oxides

crystal structure and preparation, 11: 130(J)

production from monazites, cost analysis of, 11: 13631

recovery from $Cr-Eu_2O_3-Fe-Ni$ systems, 11: 10824

sinterability at various temperatures in oxidizing and reducing conditions, 11: 970

thermal expansion coefficient from 30 to 840°C, 11: 7964

Evaporation

(See also Vaporization.)

Evaporators

(See also Distillation apparatus.)

corrosion of waste, 11: 13749

corrosion rate by 25 Process product, 11: 8378

design, 11: 4407(R)

design and performance for uranyl sulfate solutions, 11: 984

design and performance for use in Purex Process, 11: 7482

design for preparation of metallic films, 11: 6377

design for processing Homogeneous Reactor Test solutions, 11: 2648, 8623, 12538

design for radioactive waste processing, 11: 2407, 2408, 2411, 2469

design for Submarine Intermediate Reactor heat transfer system, 11: 3783(R)

design for water-d_2 recovery, 11: 7500(R), 8623

Freon bent tube, performance, 11: 2433

heat transfer, calculation, 11: 13712

heat transfer of tube bundles in, design and testing for Redox, 11: 3381

operation, effects of corrosion and fission products on, 11: 7417(R)

performance on Hanford metal recovery process waste, 11: 8441(R)

steam-heated, falling film, testing for use in concentrating waste solutions, 11: 2306, 2470

Evaporators (cont'd)

stress corrosion cracks, plugging with boiler sealing compounds, 11: 13089

testing for the Submarine Intermediate Reactor, 11: 227

testing of welds after thermal cycling, 11: 13090

two tube steam, design, materials, operation, and performance, 11: 1850

two tube steam, testing, 11: 7164

vacuum, leaks in neoprene gaskets, 11: 448(R)

vacuum for preparation of thin films, design, techniques for use, 11: 3007

Experimental Boiling Water Reactor

control system steam by-pass valve frequency response measurements, 11: 11392

cost factors, 11: 10744(J)

criticality of, converted to D_2O coolant-moderator, 11: 6884

criticality studies, boiling and temperature effects in cold experiments, Styrofoam simulation, 11: 6522

criticality studies at zero and initial power generation levels, 11: 10718, 10745(J)

design and development, 11: 636, 4664(R), 5609(R), 6106(J), 9090, 10307(J), 10742(J), 11747(R), 11748(R), 13870(R)

flow characteristics in core of, 11: 11745(R)

fuel plate fabrication and testing, 11: 4464(R), 7629(R), 7630(R), 11689(R), 12873

operation, 11: 10742(J), 10743(J), 11745(R)

safety, design of pressure vessel, control rods, and fuel loading mechanism, and fuel element dimensional stability, 11: 13869(R)

safety, pressure vessel thermal stresses and heat generation, 11: 11745(R)

safety, reactivity and steam voids in, 11: 11745(R)

shielding and reactivity effects of voids, calculations, 11: 13869(R)

startup, 11: 10745(J)

Experimental Breeder Reactor

breeding element fabrication, 11: 7720, 10921(R), 10922

conversion ratio, physical determination, 11: 9786

conversion ratio, radiochemical determination, 11: 9784, 13517(J)

cooling system and pumps, 11: 6521(R), 7718(R)

core after meltdown, 11: 3575(J)

core structure, 11: 11746(R), 13868(R)

criticality studies, 11: 1342(J), 7707, 8562(R), 11747(R), 13866(R)

design, 11: 681(J), 1123, 4664(R), 10923(R), 11742(R), 11743(R), 11744(R), 11745(R), 13869(R), 13870(R), 13879

fission rate measurements in, 11: 9780, 13513(J)

fuel element cooling, 11: 3082(J)

fuel element dissolution, 11: 7488(R), 7825, 7856, 8323, 9580(R), 9581(R)

fuel element fabrication and testing, 11: 7723, 7864, 8462(R), 9779, 10923(R), 11689(R), 11745(R), 11746(R), 13763(R)

fuel element loading equipment, 11: 13868(R)

fuel element radiation damage, 11: 7629(R)

fuel loss, effects on breeding gain and converting time, 11: 9788

heat transfer studies, 11: 9833, 11746(R)

plutonium production and uranium consumption rates, 11: 7690(R), 13579(R)

power variation, infinities in transfer function for, 11: 12591

reactivity oscillation measurements, 11: 7863, 13488

Experimental Breeder Reactor (cont'd)

safety mechanisms, 11: 10921(R), 13763(R)

shielding, 11: 7718(R), 9107, 9782, 10923(R)

sodium transfer system, 11: 11746(R)

Explosions

(See also Atomic explosions; Chain reactions; Detonation waves; Shock waves; Thermonuclear explosions.)

applications in studies on reactor safety, 11: 6534

causes and description of refinery tank, 11: 2814

density ratio in, precision flash x-ray determination, 11: 2956(J)

in Homogeneous Reactor Experiment core tank, 11: 7752

photography, high-speed, 11: 1180

physical chemistry, 11: 6638(J)

report of hydrogen, at Oak Ridge National Laboratory on July 31, 1956, 11: 9575

shock wave propagation from strong peripheral, 11: 7215(J)

steady-state, single-reaction-supported, 11: 4902(J)

Explosives

(See also Atomic weapons; Explosions.)

particle size effects at finite and infinite diameters, 11: 4901(J)

preparation of Sb^{124}-labeled dynamite for use in tracer studies in mines, 11: 1508

Exponential piles

accountability, security, and health physics procedures for U^{235} in, 11: 12962

analysis of data from, by fitting to sinh functions, 11: 7845(R)

buckling, 11: 1321, 1667(J), 2116(R), 2139(J), 4013(R)

design and criticality, for reactor component testing, 11: 648

design for chain reaction measurements, 11: 7023(P)

flux level increase, effect of lower portion spiking with enriched material, 11: 2680

measurements on uranium, heavy water, 11: 682(J)

plutonium ^{239} for use in, and accountability, security, and health physics procedures for, 11: 8546

source reactor design for, 11: 7690(R)

Exposure chambers

See Atmosphere exposure chambers; Blast exposure chambers; Radiation exposure chambers.

Extensometers

design and performance, 11: 2575, 2925, 6376, 8518(R), 12737

Extraction apparatus

(See also Ion exchangers; Mixer-settlers; Packed columns; Pulse columns; Scrubbers; Spinner columns; Spray columns.)

concatenated pulse columns, description, 11: 192(J)

countercurrent liquid-liquid contactors, proposed program for, 11: 2333

cyclone separators, bibliography, 11: 4355

descriptions and evaluations of pulse columns and mixer-settlers for radiochemical plants, 11: 12701

design, 11: 7428(R), 8507(R)

design and feasibility of ultrasonic liquid-liquid, 11: 9256

design and performance of a gas separator for Homogeneous Reactor Test, 11: 7794

design and performance of liquid-liquid contactor, 11: 8317

Extraction apparatus (cont'd)

design and testing of horizontal pulse, 11: 9608

design for continuous ether extraction of U, 11: 4309(J), 8324

design for liquid-liquid extraction of radioactive materials, 11: 8866

design for recovery of U by solvent extraction, 11: 176, 7146

design of centrifugal extractor, 11: 7535

design of continuous-batch liquid-liquid, 11: 11493

design of ion exchange columns, 11: 189(J), 3353

design of liquid extraction column using centrifugal field, 11: 5187

design of mixer-settler systems, 11: 993

development of Higgins contactor, 11: 8315

efficiency of stacked stage, 11: 13580(R)

efficiency of three-stage pump hydroclone, 11: 11053(R)

evaluation of sieve-plate, for ethyl ether extraction of uranyl nitrate, 11: 13632

jet-mixer for Slurex Process, 11: 9643

operating characteristics of a centrifugal extractor, 11: 1827(J), 2329

operation, changes to prevent emulsion formation, 11: 12396

operation in Redox Process, 11: 13022

operation of centrifuge for homogeneous reactor systems, 11: 8627

operation of stacked stage solvent extractor for Pu recovery, 11: 13581(R)

packed columns, performance in gas-phase mass transfer, 11: 9258(J)

performance comparison of various types of, 11: 8333

performance of hydroclones, 11: 1476

spray liquid-liquid extraction columns, holdup and flooding, 11: 2867(J)

testing for Amine Extraction Process, 11: 979(R)

testing of Amex and Dapex, 11: 980(R)

testing of continuous, countercurrent, moving bed, ion exchange column, 11: 7137

testing of pulse column with Slurex Process feed, 11: 8272

testing of ultrasonic mixer-settler, 11: 4363(R)

of Thorex Process, description, 11: 8357(R)

Extrusion

tandem, development, 11: 10560(R), 12288(R)

of water at high humidities, kinetics, 11: 9212

Excer Process

chemical flowsheets, 11: 9665

development, 11: 7139(R), 7514(R), 8359(R), 9673, 11053(R), 12321(R), 12965(R)

electrolytic reduction and precipitation of U from a nitrate system, 11: 7493

electroreduction in, testing of electrodes for, 11: 7494

equipment development, 11: 7507(R), 7511(R), 9666, 12993(R), 13644(R)

preparation of anhydrous UF_4, 11: 13653(R)

production of carbon-free UF_4, 11: 7417(R)

theory, flowsheets, and cost estimates, 11: 7900

utilization for U ore processing, 11: 7512

Exhaust systems

(See also Ventilation.)

testing of, in hot cells, 11: 2294

Experimental Boiling Water Reactor

control by natural and enriched fuel elements, 11: 11745(R)

Experimental Boiling Water Reactor (cont'd)

control-rod and drive mechanism design, 11: 11745(R)

Extrusion

basic studies of tandem, 11: 10560(R)

of metals, theory, 11: 7681(R)

Eye lesions

radioinduced in tadpoles, 11: 9576(R)

Eyes

diagnosis of intraocular neoplasm by P^{32} uptake, 11: 7928(J)

diagnosis of malignant melanoma by I^{131}-uptake, 11: 7927(J)

physiology, 11: 13566(R)

physiology, relationship of flick phosphenes, 11: 7910(R)

protection against γ radiation, 11: 10415(J)

radiation effects, 11: 1395, 2784(J), 2785(J), 4229(J), 6599(J), 8769(J), 8797(J)

radioinduced cataracts, 11: 871(J)

radioiodine levels following intravenous administration to rabbits, 11: 5181(J)

tumors, radiodiagnosis, 11: 2809(J), 8817(J)

tumors, radiotherapy employing radon and Co^{60} sources, 11: 6622(J)

F

Fall-out

(See also Fission products; Sunshine Project.)

biological accumulation and persistence of, 11: 2237(R), 3307(J)

biological effects and monitoring, bibliography, 11: 51

biological hazards from contamination foodstuffs, 11: 1396(J), 9943(J)

biological hazards from Cs^{137}, 11: 9943(J)

biological hazards from I^{131}, in human and cattle thyroids and milk, 11: 9963(J)

biological hazards from Sr^{90}, 11: 6618(J), 11888(J)

dispersal, meteorological factors, 11: 1191(J), 6001, 6615, 7918, 12838

distribution of Sr^{90}, in vegetation, soils, bones, and milk, 11: 9201

distribution of Sr^{90} from atomic explosions, 11: 884(J)

distribution of Sr^{90} in North Atlantic surface water, 11: 9960(J)

meteorological uses for study of air mass movements, 11: 1264(J)

monitoring, 11: 1749(R), 3295, 3644, 4257, 5172, 5965, 7695(R), 8259(R), 9576(R), 9950(J), 10803(R), 11040(J), 11884(J), 12959(R), 13247, 13566(R)

monitoring, efficiency of scavenging devices for sample collection, 11: 12807

monitoring, from Operation Castle by γ counting, 11: 10650

monitoring, from Operation Teapot, 11: 9404

monitoring, in Swedish foods, 11: 13248(J)

monitoring, over Norway and Sweden between July and Dec. 1956, 11: 13246

monitoring, performance of radiological telemetering systems, 11: 11039

monitoring by β-decay, 11: 9508, 10662(J)

Fall-out (cont'd)

monitoring by radiometric analysis of biological materials, 11: 46, 5171, 10412

monitoring by radiometric analysis of rain water, 11: 6472, 7066, 8793(R), 9188(R), 9957(J)

monitoring by world-wide collection of samples containing Sr^{90}, 11: 3480, 4795

monitoring data from Bikini Atoll Test, 11: 9206(J)

monitoring for effects of Pacific weapons tests in California, 11: 7069

monitoring in municipal and industrial water supplies, 11: 1402

monitoring in precipitation in Mexico, 11: 8804(J)

monitoring network, AEC, 11: 13517(J)

monitoring of close-in, 11: 9956(J)

monitoring of soil and plants following thermonuclear explosion, 11: 11082

monitoring of soil at various distances from atomic explosions, 11: 12961(R)

pathological effects, 11: 832, 834, 893, 1392

predicting geographic pattern, equipment for, 11: 4547(J), 4778, 6213, 8074, 8794, 11330

protection from γ radiation by standard housing structure, 11: 9203

radiation dosage determinations, 11: 834, 4249, 6209(R), 8790(R), 10178, 10365, 12292(J)

radiation hazards, 11: 3669, 6470, 9951(J), 11884(J)

removal by municipal water treatment plants, 11: 1026

sample collector, design, 11: 6466(R), 11104

tissue distribution following pulmonary and intestinal absorption, 11: 53(J), 4249, 12315

Fall River Formation (Wyo.)

geology and occurrence of U minerals, 11: 4862

Fast fission

calculations for light-H_2O-moderated hexagonal lattices, 11: 2637

in close packed lattices, 11: 14012

fission product yields from, 11: 10719

measurement, in reactor fuel rods, 11: 2636

Fast neutron cross sections

effective, in four-group theory, 11: 10683

measurement, rapid method, 11: 5003(J)

Fast neutrons

attenuation in graphite and steel, 11: 4658

attenuation in water, 11: 1618(R)

bibliography on scattering, 11: 5488

biological effects compared with effects of γ radiation on mice, 11: 6608(J)

biological effects in Drosophila, 11: 1743(J), 5163(J)

biological effects on four-day chick embryo, 11: 7910(R)

biological effects on mice, 11: 870(J), 4785(J), 5165(J), 6195(J), 7074(J), 9915(R), 11841(R)

biological effects on rats, 11: 13232

detection, performance of proton recoil parallel plate detector, 11: 10651

detection and measurement, a comparison of results using three methods, 11: 14034

detection and measurement, using Hornyak buttons, 11: 1618(R)

detection and measurement of, performance of scintillation detector, 11: 8792(R)

Fast neutrons (cont'd)

detection and measurement of, time-of-flight technique applied to, 11: 12150(J)

detection by nuclear emulsion technique, 11: 3497(J)

dosimetry, 11: 1725(R), 5179(R)

dosimetry with Ge crystal detectors, 11: 7398(R)

effects of monoenergetic, on normal and gold-doped Ge, 11: 12504(R)

four-group theory, effective fast group cross sections, 11: 10683

graphite damage by, 11: 8314

inelastic scattering, 11: 591(J), 2067(J), 6505(J)

nuclear reactions with enriched U, calculation of constants, 11: 9072(J)

radiation effects on quartz and silica, 11: 6961(J)

reactor graphite damaged by, 11: 675(J)

retarding of, in media of high atomic number, 11: 13429(J)

scattering by atomic nuclei, 11: 591(J)

scattering by non-spherical nuclei, 11: 4010(J)

scattering from Be and C, 11: 11739(R)

slowing down in iron, 11: 9430

yield of fission neutrons for Pu^{239}, 11: 2064(J)

Fast reactors

(See also specific fast reactors, e.g., Dounreay Fast Reactor; Experimental Breeder Reactor; Los Alamos Fast Reactor; ZEPHYR.)

breeding properties, 11: 13138

control rod materials for, evaluation of, 11: 13094

critical mass variations for, using Na, NaK, S, Pb, Bi, and Hg coolants, 11: 8682

criticality constants for multigroup machine solutions, 11: 13868(R)

design, kinetics, and safety, 11: 13879

design and safety, 11: 10276

design features, 11: 682(J), 1333(J), 1654(J), 4690, 13942

design of molten fuel, 11: 13957

design studies for power production, 11: 681(J), 2128(J), 6887

design studies on non-aqueous fluid fuel converter, 11: 11800

design studies on Pu-fueled power breeder, 11: 13167

Enrico Fermi fast breeder, Monroe, Mich., 11: 5608(J)

fission product yields from discharged fuel of, 11: 10719

fuel element processing, 11: 7864

maintenance, 11: 10280

multi-group calculations for, 11: 11797, 13868(R)

neutron spectra, 11: 12210

poisoning by fission products, 11: 7840

reactivity, effect of burnup on, 11: 8685(R)

research program at Los Alamos, 11: 13165

safety, simulation of startup and loss-of-pump-power accidents, 11: 6810(J)

safety features of breeding-, 11: 4110(J)

theory, 11: 6899

Fasteners

fabrication of Ti, 11: 7194

Fatigue

contact friction, in Cr–Ni–Mo, 11: 8014(J)

crack detection methods, 11: 1053

Fatigue (cont'd)

literature survey, 11: 2935

mathematical analysis method for data, 11: 253, 12744

measurement and evaluation, 11: 12020

of metals, effects of complex stress-time cycles on, 11: 11240(J)

plastic, effect on pressure vessel design, 11: 4852(J)

statistical analysis, methods for, 11: 5854(J)

test data, punched card methods, 11: 1047, 1048

testing, automatic electromechanical stressing unit for, 11: 1225(J)

Fatty acid esters

identification following chromatographic separation, 11: 11994(J)

Fatty acids

bromination, 11: 2233(R)

chemical analysis, 11: 7695(R), 8259(R), 9576(R), 10803(R)

chromatographic separation, 11: 1725(R), 2233(R), 7398(R), 8258(R), 12961(R)

degradation, 11: 8258(R), 12960(R), 12961(R)

electrolytic fluorination, anode reaction in, 11: 3723(J)

labeled with C^{14}, preparation, 11: 8259(R), 9576(R), 13566(R)

metabolism, 11: 1431, 12642(R), 13565(R), 13566(R)

metabolism, effects of irradiation, 11: 8258(R), 2233(R), 2237(R)

metabolism in rats on fat-free and supplemented diets, tracer study, 11: 11994(J)

paper chromatography, 11: 12341(R)

synthesis, 11: 1725(R), 2233(R), 2237(R), 7398(R), 7695(R), 13566(R)

titration in acetone using tetra-alkyl ammonium hydroxide, differentiating, 11: 8846(J)

Feed materials

bibliography, 11: 10049

Feedback systems

design for grounded grid triode, 11: 5945

design of logic circuits employing feedback, 11: 9383

mismatch effects in r-f, applied to accelerators, 11: 4533

Feldspars

age estimations by $Ar^{40}-K^{40}$ and Rb–Sr dating, 11: 290(J)

age estimations by $Ar^{40}-K^{40}$ dating, 11: 287(J)

argon content and diffusion in, 11: 10542(J)

separation from meteorites, 11: 3749

spectrographic analysis for Ce and Ru, 11: 11933(J)

FER

See Fleet Escort Reactor.

Ferguson, (H.K.) Co. Atomic Energy Div., New York

progress reports on Pu production reactors, 11: 11778(R)

Fermions

(See also Electrons; Elementary particles; Mesons; Neutrinos; Neutrons; Protons.)

decay of higher spin, 11: 6982(J)

dispersion equations, 11: 1706(J)

generalization of the Dirac equation for slow, 11: 10234(J)

interactions with bosons, theory, 11: 5693(J), 5694(J)

interactions with meson fields, Dirac equation generalization, 11: 10689(J)

level density of system of, 11: 5686(J)

Fermions (cont'd)
tests of Sachs' classification of light, 11: 11344(J)
theory of interacting, 11: 4195(J), 5495
Fermium
production in a cyclotron and nuclear properties, 11: 620(J)
Fermium isotopes
nuclear properties, 11: 13443
Fermium isotopes Fm^{250}
production and nuclear properties, 11: 6879(J)
Fermium isotopes Fm^{251}
production and nuclear properties, 11: 6879(J)
Fermium isotopes Fm^{252}
production and nuclear properties, 11: 6879(J)
Fermium isotopes Fm^{253}
alpha energy spectrum, 11: 4997(J)
Fermium isotopes Fm^{254}
spontaneous fission energy release, calculated, 11: 13444
Ferns
radioinduced abnormalities, 11: 3288(J)
Ferrates
(See also Ammonium fluoferrates.)
heat, free energy, and entropy of FeO_4^{2-}, 11: 7934
heat of formation of ferrate ion, 11: 4814(R)
Ferrites
(See also specific ferrites, e.g., Cobalt ferrites.)
fabrication and microstructure, 11: 12490(R)
fabrication and properties, 11: 10560(R)
magnetic annealing effect in Fe–Ni, 11: 9352(J)
Ferritin
determination, 11: 12960(R)
physiological effects, 11: 12961(R)
preparation and chemical properties, 11: 12961(R)
radiation effects, 11: 13565(R)
Ferromagnetic materials
dielectric properties, attenuation phase shifts and intrinsic impedance, 11: 7985
Fertilizers
distribution and utilization, tracer studies, 11: 17(J)
production from Florida leached zone material, 11: 3755
Fetuses
(See also Embryos.)
abnormalities induced by irradiation of parents, 11: 3294(J)
effects of exposure, on abnormalities of adult brain in rats, 11: 1742(J)
radiation effects on hearts, 11: 3666(J)
thyroidal uptake of iodine in sheep, tracer study, 11: 3676(J)
FFAG accelerators
(Fixed field alternating gradient)
axial oscillation growth simulation equation solutions, 11: 9499
beam acceleration, 11: 3161, 3168, 3173, 3587
beam focusing, 11: 3106, 3109, 3110, 3113, 3119, 3127, 3134, 3136, 3137, 3147
FFAG accelerators (cont'd)
beam focusing, effect of magnetic fields, 11: 3112, 3123, 3128, 3129, 3136, 3145, 3146, 3147, 3149, 3152, 3165
beam focusing, effects of non-linearities in a-g, 11: 3105, 3111, 3120, 3135, 3141
beam focusing by alternate gradients, 11: 3122, 3124, 3125
beam guidance, study with Brookhaven National Laboratory electron analogue, 11: 3163
beam loading, effect on r-f cavity, 11: 3174
beam oscillations, 11: 3110, 3115, 3116, 3117, 3126, 3140
beams, effects of space-charge on, 11: 3114
beams, experiments on radio frequency knockout of stacked, 11: 7344
design of spiral sector, 11: 11457
design principles, 11: 3125, 3130, 3131, 3132, 3146, 3162, 3164, 3169, 3185(J)
electron model, 11: 9149(J)
equilibrium orbit, 11: 7343
focusing effect of oscillations of the equilibrium orbit, 11: 3139, 3143, 3144
frequency measurements and resonance survey in the electron model spiral sector, 11: 13528
Hill equation studies, 11: 3178, 10637
intersecting beams, multiple scattering and beam lifetime, 11: 3161, 3166, 3170
magnetic fields, 11: 3109, 3138, 3142, 3172, 3147, 6555
magnetic resonance, 11: 12917
magnetic resonances, effect of non-linear restoring forces, 11: 3105, 3106
magnets for electron betatron, 11: 3162
modification of Liouville's theorem for beam analysis, 11: 3171
oscillations, effect of field inhomogeneities, 11: 3116
particle momentum, effect of field strength, 11: 3117
particle motion in, near coupling resonances, 11: 9498
particle orbits, 11: 3113, 3126, 3135, 3144, 3185(J)
particle orbits, effect of change in field gradient, 11: 3112, 3151, 3160
particle orbits, equations of motion, 11: 3118, 3150, 3153, 3155, 3157, 3158, 3160, 3164
particle orbits and betatron oscillations of two-beam, mathematical analysis, 11: 10767
particle trajectories stability, approximate transformations for, 11: 3156, 3159, 3167
phase oscillations, 11: 3107, 3130, 3154
radiofrequency cavity, electrical properties, 11: 3586
radiofrequency experiments on electron model, 11: 6941
radiofrequency system for experiments with electron model, 11: 6940
requisite energy tolerance at injection, 11: 3121
resonance near $3\sigma_x + 2\sigma_y = 2\pi$, computational evidence for spirally-ridged, 11: 11456
tables of functions for parameters in, 11: 3175, 3176, 3177, 4722
Fibrinogen
radioinduced changes in, effects on blood clot formation, 11: 4839(J)
Field theory
(See also Quantum electrodynamics.)
boson family from quantized finite-particle Maxwell, 11: 10384(J)
coupling of nuclear forces, potential, 11: 3623(J)
formulation of quantized, 11: 12945(J)

Field theory (cont'd)

gravitational forces and quantum field theory, 11: 10379(J)

Hamiltonian formulation of, with the form factor, impossibility of, 11: 10374(J)

meson, convergence of the Tamm-Dancoff formalism, 11: 1633(J)

meson, densities of physical quantities and conservation laws for, 11: 2207(J)

meson, integral expression with retarding potentials, 11: 3624(J)

nonlinearity and conformal reciprocity, 11: 4188(J)

non-local and non-linear, analysis, 11: 7381(J)

nuclear propagation function in quadratic approximation, 11: 4017(J)

particle with mass zero, theoretical consequences, 11: 13557(J)

perturbation series in quantum, mathematical analysis, 11: 2202(J)

pseudoscalar interactions in non-linear meson dynamics, 11: 2032(J)

quantum, book, 11: 810(J)

quantum, equation of dispersion, 11: 1706(J)

quantum, equations in, 11: 2214(J), 6169

quantum, hydrodynamical aspect in multiple production of particles, 11: 12190(J)

quantum, method of functionals in, 11: 6180(J)

quantum, new model for Green function, 11: 805(J)

quantum, of unstable particles, 11: 13558(J)

quantum statistics, and multiple production of mesons, 11: 9029(J)

quantum theory relativistic invariance, 11: 6170(J)

scattering problems, 11: 10336(J)

spectral representation of Green's functions for interaction fields, 11: 2203(J)

spinors and Fermi fields of infinite space, 11: 8238(J)

Films

(See also headings for the classes of films, e.g., Oxide films and specific films, e.g., Adsorbed films; Carbon films; Corrosion films; Indium films.)

epitaxy in thin surface, 11: 129(J)

formation rates in reactor tubes of Clinton Reactor, effects of radiation on, 11: 7741

preparation by vacuum evaporators, 11: 3007

preparation of thin, of radioactive material, 11: 4962(J)

thickness measurements by β-back-diffusion, 11: 3799(J)

use of commercial sheet, for spectrochemical analysis, 11: 6307(J)

Filter materials

efficiency, 11: 2473, 3886(R), 4417, 6322, 7920(R), 8790(R), 8791(R), 8792(R), 8837

preparation of a submicron, inorganic, vitreous, 11: 11510(P)

Filter papers

evaluation for use in field sampling of particulate contamination, 11: 13571(R)

penetration characteristics, 11: 2553(R)

Filters

(See also Membrane filters; Metallic filters; Oxide filters; Screens; Traps; Water purification equipment.)

aerosol penetration through a lead-shot column, effect of particle size, 11: 1030(J)

aerosol penetration through fiberglas and sand, effect of particle size, 11: 1029(J)

continuous-feed, design, 11: 3246(P)

design of wedge, for use with 4 Mev linear accelerator, 11: 10330(J)

Filters (cont'd)

efficiency for air cleaning, 11: 8793(R), 8837, 11038, 11649, 13597(R)

efficiency of composite kompak, 11: 4418

efficiency of millipore, 11: 6209(R)

efficiency of sand, 11: 52(R)

Fiberglas, decontamination of ventilation air by use of, 11: 11975

for hot laboratory ventilation systems, design considerations, 11: 11041(J)

performance in aerosol sampling by fluorimetric analysis, 11: 10122

radiometric analysis for Sr^{90}, 11: 3690, 6612, 6613

testing, 11: 9649

unplugging of NH_4NO_3-clogged air, use of steam for, 11: 5830

Filtration

apparatus for valuable precipitates, 11: 5087(P)

Finned tubes

applications in nuclear engineering, 11: 5301(J)

drawing and extrusion, 11: 2633(R)

fabrication of Be, 11: 2494(R), 2495(R), 9729(R), 11691(R)

heat transfer characteristics of Al, 11: 2633(R)

heat transfer correlations for air-cooled, 11: 6329

Fires

(See also Ether fires; Lithium fires; Potassium–sodium alloy fires; Sodium fires; Uranium fires.)

handling and controlling in plant production and storage areas, 11: 3420

induced at military installations by atomic explosions, 11: 1403

Fish

metabolism of Sr in, tracer study employing Sr^{89}, 11: 6224(J)

metabolism of yttrium in, tracer study employing Y^{91}, 11: 6225(J)

radiometric analysis, 11: 878, 5965, 13569

strontium^{89} content determined by external monitoring, 11: 1257(J)

toxic effects of less common metals, 11: 1026

Fission

(See also Capture-to-fission ratios; Chain reactions; Fast fission; Multiplication factor; Nuclear reactions; Photofission; Proton fission; Spallation; Spontaneous fission.)

angular correlation in high-energy, 11: 10321(J)

cross sections for, as a function of temperature, 11: 590(J)

energy barrier, 11: 2740

energy dependence of fission width, 11: 5629(J)

energy from, in the Brookhaven National Laboratory shielding facility, 11: 11822

energy release, calculated, 11: 13444

energy spectra of delayed neutrons from, 11: 2021(J)

fragment charge distribution, data for calculating, 11: 10685

high-energy, interpretation, 11: 10326(J)

of medium-weight elements, 11: 12341(R)

neutron emission from various modes of, calculation, 11: 6048(J)

neutrons from, angular correlation, 11: 591(J)

of plutonium^{239} by slow neutrons, number of neutrons emitted in, 11: 712(J)

theory, 11: 591(J), 685(J), 3096(J), 3560(J)

thresholds studied by (d,p) stripping reactions, 11: 6507

use of Zr^{96} for measuring, of U^{235}, 11: 12503

Fission chambers

design, operation sensitivity, and circuits for large, 11: 2612

design of miniature, 11: 11745(R)

design of sample holder for, 11: 9562(P)

design which minimizes maintenance and reduces dead time, 11: 9567(P)

multiple ionization chambers as detector for high resolution study of neutron cross section, 11: 1273(R)

operation, review, 11: 502(J)

Fission products

(See also Fall-out; Sunshine Project.)

absorption and tissue distribution in plants and animals, 11: 6223, 7695(R), 8258(R), 11082

activity of, in core solution of homogeneous breeder reactor, 11: 4079

adsorption, 11: 7835(R), 13698(R)

adsorption by Al and Fe hydroxides, 11: 5277

adsorption by ion exchange resins and non-resinous solid adsorbents, 11: 8381(R), 11798(R), 13676(R)

adsorption by LaF_3 or MnO_2, 11: 7520

adsorption by various adsorbents in Thorex Process, 11: 13019(R)

adsorption from homogeneous reactor fuels, 11: 11634(R)

adsorption from reactor solutions, evaluation of CaF_2 and silicates for, 11: 9633(R)

adsorption from UO_2SO_4 fuel solution by CaF_2, 11: 8382(R)

adsorption on calcium fluorites, powdered PbS, Galena, and monazite sands, 11: 7836(R)

adsorption on clays and soils, 11: 1497, 6223(J), 8258(R)

adsorption on river sediment, 11: 8790(R), 8791(R), 8792(R)

adsorption of β-radioactive, on $Pb_3(PO_4)_2$, CaF_2, $LiAlO_2$, and PbO, 11: 13007(R)

adsorption of rare earth, by CaF_2 for homogeneous reactor fuel reprocessing, 11: 11662

adsorption system for Homogeneous Reactor Test, design, 11: 7811, 11614

analysis for Cs^{137} activity, 11: 942(J)

analysis for Np, Pu, and U, 11: 3702

angular distribution, effect of conservation of angular momentum, 11: 2155(J)

availability and economics, 11: 2775(J)

beta decay, 11: 11040(J)

bone deposition following ingestion, 11: 3680(J)

buildup, effect on pile reactivity, 11: 8584

buildup and solubilities in UO_2SO_4 solutions, 11: 7857(R)

buildup in Th breeder reactors, 11: 1373

burnout rate for high cross section, 11: 11779

calculated activities and abundances from U^{233}, 11: 8982

charge distribution, new data for calculating, 11: 10685

chemical properties and separation, 11: 168(J), 1542(R), 5282

containers for, design, 11: 13043(R)

cost as radiation sources for industrial sterilization, 11: 12756

cross section measurements, proposed program of, 11: 11391

decay energy from, in reactors, 11: 655

decontamination in process solutions, 11: 8361(R)

decontamination in waste processing, 11: 2469

deposition on core walls of Thorium Breeder Reactor and Homogeneous Reactor Test, 11: 7804

Fission products (cont'd)

desorption with oxalic acid, 11: 7521

detection, performance of fission detectors, 11: 3478

detection and measurement, in Hanford coolant water, 11: 13852

detection in nuclear emulsions, 11: 591(J)

determination in Purex Process streams, 11: 11585

determination of residual activities from U^{235}, 11: 3934

determination of volatile products from fuel elements, 11: 12973(R)

diffusion from U-impregnated graphite, 11: 7711, 8312, 8386(R), 8756, 12982

diffusion through Al clad sheets, effect on cooling water, 11: 11712

disintegration rates and constants for calculation of, 11: 2738

disposal, 11: 12240(R)

distribution in corrosion products and adsorption on surfaces, 11: 8720(R)

distribution of Pu and, between molten U and UF_3-BaCl_2 mixtures, 11: 6308(J)

effects on reactivity of homogeneous thermal breeder, 11: 11760

effects on regeneration factor of $Th^{232}-U^{234}$ thermal reactors, 11: 9787

electrolytic separation, 11: 6679

energy distribution of mass-97, from U^{235} thermal fission, 11: 2230(J)

energy losses, 11: 591(J)

escape, radiological hazards, 11: 56(J)

escape by diffusion through a Na-filled crack, 11: 11729

evaporation from Th–U alloys by electric arc melting, 11: 12309

extraction from powdered and molten U and U alloys, 11: 13582(R)

formation of gaseous, in homogeneous reactors, 11: 13890

fused salt extraction from U, 11: 8387(R)

gamma emission and decay, 11: 591(J), 1618(R), 7845(R), 10365

health hazards from nuclear reactors, 11: 11558

heat released in Liquid Metal Fuel Reactor fuel, 11: 13885(R)

heat transfer in cold trap for gas stream from reactor, 11: 2428

heating of Homogeneous Reactor Test cold traps by radioactive, 11: 13909

high-temperature separation from Th fuels, 11: 6294

industrial uses in radiochemical applications, 11: 1462

industrial uses in radiosterilization of foods, 11: 11023(R)

ion exchange separation, 11: 9109(R)

ion exchange separation from Pu and U, 11: 8867

ionization measurements, 11: 7692(R)

liquid metal and molten salt extraction from U, 11: 7544(R)

liquid metal and molten salt extraction from U and U–Zr alloys, 11: 7543(R)

liquid metal extraction from U reactor fuel, 11: 1810(R)

mass estimation methods, 11: 4959(J)

mass excesses, 11: 13444

mass-yield curve for fission of natural U by 14-Mev neutrons, 11: 12955(J)

masses, energies, and dispersal of fragment pairs from slow neutron induced binary fission of U^{235}, 11: 1635

maximum permissible limits in air, 11: 11036

metabolism, by plants and animals, 11: 893, 2237(R), 2242(R), 6223(J), 8257(R), 8259(R), 10412, 11082, 11556(R), 12960(R), 12961(R), 13566(R)

molten salt extraction from U, 11: 8388(R)

Fission products (cont'd)

monitoring of gaseous, 11: 1984, 11036

monitoring of ingested or inhaled using thyroid scintillation monitor, 11: 6209(R)

neutron absorption cross sections at intermediate and high energies, statistical evaluation, 11: 8151(J)

nomogram for radioactivity analysis, 11: 11260

nuclear and chemical properties, 11: 8282(R)

pathological effects of, in fall-out from Castle Operation, 11: 832

poisoning of fast reactors by, 11: 7840

poisoning of U^{235}, energy dependence, 11: 6183(J)

production, processing, and disposal, 11: 10387(J)

production in core and extent of poisoning by, 11: 8601

from proton fission of Bi, Th, and U, distribution curve, 11: 1279(J)

radiation dosage determinations for mixed, 11: 2796, 3669

radiation sources from, 11: 8862(J)

from radioactive fall-out, uptake by plants and animals, 11: 9576(R)

radioactivity and weight of, formed in reactor fuel, 11: 5670

radioactivity from fuel elements in canal storage, 11: 14032

radiometric determination, performance of proportional detectors for, 11: 7263

radiometric determination in rain water, 11: 7066

radiometric determination in soils and urine, 11: 8793(R)

reactor criticality effects, 11: 8590

recoil separation in reactor slurries, 11: 6925(J)

recovery from calcined first-cycle solvent extraction wastes, 11: 12373

recovery from irradiated U by, 11: 8379

recovery from reactor waste, 11: 13043(R)

recovery from Redox raffinate, 11: 13636

recovery from waste solutions, 11: 12007

recovery with U and U daughter from cellulose pulp column with acetone and ethyl ether, 11: 1493

release from fuel element failure, 11: 12236

release of gaseous, in reactors, 11: 13189(R)

removal from Bi coolant by $BiCl_3$ reaction, 11: 9640

removal from effluent water by tannic acid and lime, 11: 10033

removal from plutonium and U solutions by charged wire technique, 11: 11599

removal of rare-earth, from Homogeneous Reactor Test fuel solutions, 11: 8708(R)

removal processes, 11: 13189(R)

separation, with corrosion products from Homogeneous Reactor Test breeding blanket, 11: 13657

separation and decontamination in Thorex Process, laboratory development studies, 11: 8395(R)

separation and purification from process solutions, 11: 3367(J)

separation by chemical processes, 11: 2741

separation by nuclear recoil, feasibility, 11: 1341(J)

separation by zone melting from U and U alloys, 11: 13807

separation from fuels, 11: 11391

separation from irradiated Th–U alloys by arc-zone melting, 11: 6295

separation from irradiated U by UO_2 drossing, 11: 5260

separation from liquid wastes and soils, 11: 52(R)

separation from molten U by scavenging with solid U oxide, carbide, and nitride, 11: 8389

Fission products (cont'd)

separation from Pu and U–Pu, 11: 8877(J)

separation from Pu by adsorption, 11: 11619

separation from reactor fuels, processes for, 11: 5268(J)

separation from reactor waste, 11: 520(J), 2469

separation from solution by a precipitator-column, 11: 5818, 7138

separation from Th–U by volatilization, 11: 9639(R)

separation from Th–U alloy be gravity flow through $CaCl_2$ beds, 11: 13292

separation from U and Pu by coprecipitation with phosphates, 11: 11514(P), 11515(P), 11516(P)

separation from U by distillation, fused fluoride extraction, and oxide scavenging, 11: 7542(R)

separation from U by liquid Mg and fused F^- extractions, 11: 7545(R)

separation from U by Mg extraction, 11: 13680(R)

separation from U-impregnated graphite, 11: 11562(R)

separation from UF_6 by distillation columns, 11: 7476

separation from UO_2SO_4 solutions by sorption, 11: 7837(R), 11635(R)

separation from water, efficiency of municipal and industrial water treatment plants, 11: 1402

separation from waste streams, 11: 8257(R)

separation of carrier-free Cs^{137} from, by coprecipitation, 11: 11122

separation of Pu and U from, 11: 13288

separation of rare earth, 11: 7134, 7430(R)

separation of radioiodine, by use of silver reactors and filtration, 11: 11975

skeletal deposition, effects of zirconium citrate and edathamil sodium, 11: 1755(J)

solubilities in reactor solutions, 11: 8706(R)

solubility, 11: 12970(R)

solubility of sulfates, 11: 11801(R)

solvent extraction, 11: 7969

solvent extraction in Thorex Process, 11: 13019(R)

solvent extraction with organo-phosphorus compounds, 11: 9663

sorption, applications in waste disposal, 11: 10508

stable, poisoning of thermal reactors by, 11: 1324

thermodynamic calculations for disposal in high temperature carbide pile, 11: 6713

tissue distribution and biological effects, 11: 11558

uptake and tissue distribution in clams, 11: 3675

uptake by plants and animals, 11: 2233(R)

uptake by plants from contaminated soil, effects of exchange reactions and cropping, 11: 897

utilization in industrial radiation sources, 11: 8279(R)

vaporization by melting of reactor fuel plates, 11: 11970

vaporization of metals by, 11: 5524(J)

volatilization from molten and solid Th–U alloys, 11: 12487

volatilization from Th–U alloy, 11: 3756(R)

waste disposal by fusion with siliceous material, 11: 5827

yield from proton bombardment on Th^{230}, Th^{232}, and U^{233}, 11: 8191

yield of uranium relation of isobaric chains and atomic number, 11: 2741

yields from discharged fuel of fast reactors, 11: 10719

yields from power reactors, 11: 5006

Fission recoils

decomposition of NO and NO_2 by, from fission fragments of U^{235}, 11: 11962(J)

oxidation of $FeSO_4$ solutions and decomposition of $HCOOH-O_2$ solutions by U^{235}, 11: 11564(R)

Fissionable material

critical hazards of interacting containers of, general theory, 11: 13853

critical volume of sphere of, surrounded by reflector, 11: 4104(J)

criticality accidents with, potential hazards, 11: 11560

criticality studies of oralloy assemblies, 11: 9185(J)

irradiation in Materials Testing Reactor, design of equipment for, 11: 7819

irradiation techniques for, 11: 2185(J)

multiplication coefficient, 11: 682(J)

neutron cross sections, 11: 6010

radiation damage in, theory, 11: 766(J)

safe interaction criteria for containers of, handled at Oak Ridge Gaseous Diffusion Plant, 11: 13832

storage, comparison of homogeneous and heterogeneous, 11: 4612

storage at Oak Ridge Gaseous Diffusion Plant, criticality studies, 11: 12633

Flames

effects of β radiation on the rate of propagation of propane-air, 11: 12695(J)

emission spectra of propane-air, irradiated with 1000-curie Au source, 11: 12696(J)

Flanges

cracks in bolts and ferrules, 11: 6536(R)

development of high-pressure, for homogeneous reactors, 11: 3465, 10292

metallography of Homogeneous Reactor Test, 11: 4087, 4876, 5010, 9288

recommendations for high-pressure, 11: 9754

rupture of remote connecting studs in Purex Process, 11: 7161

stress analysis and failure, 11: 2545

testing of high-pressure, 11: 7507(R)

testing of high-pressure, in homogeneous reactor chemical plant, 11: 7139(R)

Flavones

metabolism, 11: 13565(R)

physiological effects, 11: 13565(R)

radiosensitivity effects in rats, 11: 12959(R)

Flavonoids

metabolism in rats, 11: 12960(R)

preparation from corresponding flavonoid rhamnoglucosides, 11: 7012(P)

Flocculation

performance of Sarapan and CaO as pulp settling agents, 11: 4861(R)

of phosphate slimes, preparation and evaluation of agents for, 11: 2815

reagents used, comparison and equipment, 11: 11176

Florida (De Soto Co.)

stratigraphy relations of formations in, 11: 2909(J)

Florida (Hardee Co.)

stratigraphy relations of formations in, 11: 2909(J)

Florida leached zone material

acid leaching at atmospheric pressure for Al, P, and U recovery, 11: 5263

Florida leached zone material (cont'd)

acid leaching for U recovery, cost factors, 11: 182

beneficiation and acid and caustic leaching for conversion to marketable products, 11: 3755

beneficiation by flotation, 11: 976(R)

filtration studies, conditions of gypsum precipitation, 11: 7970

laboratory research and processing, 11: 10037

nitric acid leaching, 11: 2363(R)

processing, comparison of methods, 11: 4364

processing for U and Al extraction, 11: 11647(R)

Flotation

application to the separation of various solids, 11: 6690(J)

hydrolytic and ion pair adsorption processes, 11: 3766

testing for U recovery from ores, 11: 10478(R), 10479(R)

tests, 11: 7192(R)

Flotation reagents

adsorption on AgI, 11: 3784

efficiency for U separation from ores and concentrates, 11: 10479(R)

testing as aids to pulp suspension, 11: 11176

for uranium separation from ores and concentrates, 11: 7192(R)

Flowmeters

(See also Fluid flow; Gas flow; Rotameters.)

bibliography, 11: 6345

calibration of pitometer for Submarine Intermediate Reactor steam generator, 11: 12512

design, calibration, and operating characteristics of thermal gas, 11: 8551

design, for use in simulated reactor channels, 11: 13932

design and testing for Redox Process, 11: 13674

design and testing of magnetic induction, 11: 7700(R)

design for Homogeneous Reactor Test leak detector system, 11: 4917

design for UF_6 flow rates, 11: 10811(R)

edge effects in electromagnetic, 11: 3917(J)

Fluid flow

(See also specific devices such as Heat exchangers for fluid flow information. See also Compressible flow; Convection; Gas flow; Incompressible flow; Plastic flow; Subsonic flow; Supersonic flow.)

bibliography, 11: 4484

of boiling water in rectangular channels, 11: 4664(R)

of Columbia River between fixed points, methods of measurement, 11: 49

critical and subcritical, through fittings and sharp-edged orifices, 11: 5833

cross flow of water through tube banks at high Reynolds numbers, 11: 1503

data for square array tubular heat exchangers, method of correlating, 11: 9703

device for electrolyte eluants in column chromatography, 11: 5841

distributions, effect of surface roughness, 11: 2440

in ducts, theory, 11: 9276

effect of flow pattern on shielding design, 11: 1704(J)

effect of narrow liquid-filled spaces on vibration and shock characteristics of structures, 11: 2436

effects on interfacial areas of dispersions, 11: 1852(J)

Fluid flow (cont'd)

experimental studies, 11: 11160

free convection flow studies, 11: 13714

free convection heat transfer to a horizontal cylinder from an ordinary fluid containing a volume heat source, 11: 11159

for fuel element configurations, 11: 10515

heat transfer from cylindrical rods during two-phase stream cross sectional, 11: 251(J)

heat transfer review, 11: 5300(J)

in a horizontal pipe, two-phase, 11: 13312(J)

kinetics of oscillatory, 11: 9705

mass and heat transfer in concurrent liquid-gas, 11: 12015(J)

mathematical analysis, 11: 7168(J)

mathematical analysis of compressible flow, 11: 2890

mathematical analysis of laminar cavitation streamline over curvilinear arc, 11: 244(J)

measurement of heat transfer at its critical point, 11: 6703(R)

monograph on the theory of characteristics, 11: 11168(J)

Onsager's principle and its significance for rheological problems, 11: 7165

in packed and fluidized systems, hydraulic aspects, 11: 1040

in pipes, two-phase, review, 11: 5840

pressure drop and critical flow for steam-water systems, 11: 10057

pressure drop in, methods of computing for slurries, 11: 237

redistribution of coolant in Materials Testing Reactor, tests, 11: 2431

relation between friction factors based on total and static pressures, 11: 13307

research program at Westinghouse, 11: 3794

shear forces due to, on surfaces of finned annuli, mathematical analysis, 11: 5912

steady state, in reactor fuel matrix with nonuniform heat generation and boiling, 11: 10059

steam-water two-phase, annular, void fractions in, 11: 5842(J)

theory, 11: 1036, 1236(J)

thermal characteristics in circular conduits, annuli and between parallel plates, 11: 1045(J)

three-dimensional boundary layer in, theory, 11: 248(J)

two-dimensional, from apertures under head, phenomena, 11: 3795(J)

unsteady equations for, 11: 9281(J)

velocity distribution of, through 90° elbows, 11: 2427

Fluid flow (laminar)

conducting fluid in straight conduit, with transverse magnetic field, 11: 8898(J)

convective, in heat generating fluids, 11: 236

heat transfer to non-Newtonian fluids for, through tubes, 11: 6335(J)

Hedstrom plot for calculation of pressure drop for Bingham plastic materials, 11: 9277

mathematical analysis of pressure loss and density factors, 11: 9278

in porous metals, determination of isobars, 11: 1038

pressure losses of slurries in pipes and pipeline transitions, 11: 4416

tracer techniques, 11: 1039

Fluid flow (turbulent)

analysis in homogeneous reactor fuel systems, 11: 8594

friction layers with rising pressure, 11: 242(J)

heat transfer, 11: 11669

Fluid flow (turbulent) (cont'd)

heat transfer in heated annulus, method of solution adaptable to digital computation, 11: 10055

mathematical analysis of pressure loss and density factors, 11: 9278

pressure losses of slurries in pipes and pipeline transitions, 11: 4416

tracer techniques, 11: 1039

Fluid fuel reactors

(See also Homogeneous reactors; Liquid Metal Fuel Reactor; Los Alamos Molten Plutonium Reactor Experiment.)

batch vs continuous fuel processing, 11: 2136(J)

bibliographies of physics, engineering, core and blanket processing, and general technology, 11: 6883

circulating fluoride, uranium investment in, 11: 13911

circulating liquid metal, studies on occurrence of undamped oscillations, 11: 10274

circulation systems, 11: 7770

conversion factor in, 11: 4657

description for production of U^{233} and power, 11: 1338(J)

design, control, and power distribution for moving fuel, 11: 13163

design and evaluation as power-breeder, 11: 12596

design and feasibility study of 600-Mw, homogeneous, fused-salt, 11: 7325

design of, using liquid metal fuel, 11: 12252(J)

design of fluidized bed, 11: 4776(P)

design of fused salt fast power breeder, 11: 10724

design of internally cooled liquid metal, 11: 13516(J)

design of Liquid Metal Fuel Reactor power plant, 11: 13511(J)

design of nuclear power plant with closed-cycle gas turbine, 11: 6538(J)

design of power breeder, proposed program, 11: 8665

design parameters and experiment objectives, 11: 12215

design studies of, using U–Bi fuel, 11: 8578

design studies of graphite moderated, U–Bi fueled, 11: 12214(R)

design study for power, effect of direct contact cooling, 11: 2106

design with hydroclones for thickening and recirculating fluid, 11: 11527(P)

development and problems, 11: 1661(J)

economic comparison of large scale Liquid Metal Fuel Reactor breeder and burner, 11: 12216

feasibility of circulating fluoride system as power producer, 11: 9114(J)

fission product generation in U–Bi fuels, 11: 5603(J)

fission product removal from U–Bi fuel, 11: 8331

fuel cycles for single-region thermal, 11: 6096(J)

heat transfer, 11: 13309

heat transfer, effect of direct contact cooling in design, 11: 2106

heat transfer in the cores, 11: 2707

kinetics, Univac analysis of, 11: 13885(R)

kinetics of, investigated by perturbation methods, 11: 13884(R)

liquid metal, intermediate heat exchanger circuits for, 11: 5123(P)

maintenance, 11: 10280

moderators for, reactivity effects of, 11: 12871

molten-fluoride Th–U^{233} converter for power production, design, 11: 13939

multigroup theory, 11: 13935

Fluid fuel reactors (cont'd)

non-aqueous, nuclear data and design methods, 11: 11800

reactivity effects of moderators in, 11: 12871

temperature-dependent kinetics, 11: 13517(J)

thorium–U^{233} in fused $LiF-BeF_2$, design, 11: 13903

xenon poisoning, 11: 4069

Fluid propellants

(See also Jet engine fuels.)

heat transfer acid pressure drop of HNO_3 flowing through heated tube, apparatus for measuring, 11: 10060

radiation effects, 11: 11469

Fluidization

application to nuclear technology, 11: 11565

design of equipment, 11: 6742

in multiple fluidized beds, 11: 3364(J)

of pellet beds, flow-rate data, 11: 1040

principles, 11: 229(J)

Fluids

(See also Body fluids; Hydraulic fluids.)

calculation of hydrodynamic problems involving large distortions, 11: 8899(J)

heat transfer from, containing a distributed heat source, 11: 13309

hydrodynamics of oscillating disks in viscous, 11: 6339(J)

hydrodynamics of reacting and relaxing, 11: 5843(J)

mixtures, statistical order-disorder analysis in multicomponent, 11: 9394(J)

motion, effect of one dimensional blast waves, 11: 1277(R)

Taylor instability, 11: 231, 232, 233, 234

Fluoberyllate ions

dissociation constant, study by ion-exchange method, 11: 8032(J)

Fluoborates

(See also Potassium fluoborates.)

analytical uses for weight determination of alkali metals in borates, halides, nitrates, and nitrides, 11: 7122(J)

Fluorescence

(See also Luminescence; Scintillation.)

of gases due to fast particles, spectroscopic examination, 11: 1216(J)

of organic molecules, quenching effects of CCl_4, 11: 1179(R)

research programs, 11: 1178(R), 4488

in solutions, theory of concentration quenching, 11: 3879(J)

studies of resonance, 11: 6866(R)

Fluorescent penetrant inspection

testing Zyglo for, 11: 3397

Fluoride complexes

(See also specific fluoride complexes, e.g., Uranyl fluoride complexes.)

with cerium(III), lanthanum(III), and gadolinium(III), formation in aqueous solution, 11: 11113(J), 11966(J)

with cupric, Ni^{2+}, and Zn^{2+} ions, stability, 11: 146(J)

Fluoride crystals

(See also specific fluoride crystals, e.g., Manganese fluoride crystals.)

fluorescence of dye centers in, 11: 147(J)

Fluoride ions

corrosive effects on stainless steel tank, 11: 7603

wave functions for, 11: 11254(R)

Fluoride volatility processes

chemical flowsheets, 11: 7509(R)

decontamination, 11: 9581(R)

development, 11: 9580(R), 13682(R), 13870(R)

development and flowsheets, 11: 3367(J)

development for processing enriched reactor fuels, 11: 7408(R)

development for recovery of U from reactor fuels, 11: 8388(R)

development for use with feed materials, 11: 8386(R), 9253

development of a UF_6 distillation process, 11: 13024(R)

development of fluorine disposal system, and gas-liquid contacting studies, 11: 7139(R)

development of single step, for UF_6 preparation, 11: 7575

dissolution of Al–U and Zr–U alloys and BrF_3 volatilization, 11: 8387(R)

dissolution studies, 11: 7407(R)

equipment for removal of hydrogen fluoride from F_2, 11: 5254

flowsheets and economics of selection of optimum fluorinating agent, 11: 12357

liquid phase fluorination studies, 11: 13576(R)

mathematical analysis of uranium fluorination, 11: 8423

metal solution, 11: 10820(R)

metal solution, equipment design for, 11: 13579(R)

phase studies, 11: 8882(J)

pilot plant studies, 11: 7710(R)

plutonium and fission-product recoveries, 11: 8379

plutonium recovery, 11: 11564(R)

power reactor fuel processing status report, 11: 7513(R)

procedures, 11: 7709(R)

process efficiency, 11: 5269(J)

processing of irradiated fuel elements by, equipment and procedures, 11: 11968

relative volatilities of UF_4 and PuF_4, 11: 11620(R)

separation and determination of U by, 11: 8426

separation of U from ores and reactor fuels, 11: 11653

solubility studies, 11: 13661(R)

uranium recovery from recycle wastes by, 11: 13655

use of continuous condenser for recovery of UF_6 from diluent gases in, 11: 12709(J)

Fluorides

(See also fluorides of specific elements and Rare earth fluorides; Uranyl fluorides.)

acid-base behavior in hydrofluoric acid systems, 11: 12681(J)

boiling points of U and fission-product, 11: 11653

chemical determination in Pu, 11: 10839

complexing with Al, to allow U recovery from aqueous solutions, 11: 6998(P)

complexing with B, 11: 7559

concentration in Scioto River, 11: 6222

corrosive effects on chemical process equipment, 11: 9638

densities of salt mixtures at room temperature, 11: 13609

determination in dissolver solutions, 11: 11586(R)

Fluorides (cont'd)

determination in Zr, 11: 11578(R)

determination of, in fluoride volatility samples, 11: 13580(R)

determination of, in silicates, 11: 3351(J)

disposal in Th and U refining and reduction operations, 11: 1026

distillation, separation, and corrosive effects of, 11: 13883(R)

effects on carbohydrate metabolism in domestic animals, 11: 5134(R)

electrolysis, anode reaction in, 11: 3722(J)

liquid-vapor equilibrium in $HNO_3-H_2O-F^-$ system, 11: 4318

metabolism in rabbits given drinking water containing from 0 to 155 ppm fluoride over a 19-day period, 11: 7907(J)

nuclear magnetic resonance spectrum of aqueous complex metallic, 11: 3720

optical properties and x-ray diffraction data for inorganic, 11: 1202

preparation and properties, 11: 5799(J)

preparation of cubes containing U and, 11: 8421

removal from waste solution, 11: 2469

removal with Al and ferric nitrates, 11: 11629(R)

separation from UO_4, 11: 3223(P)

solubility of inorganic, 11: 13633(R)

solvolysis and stoichiometries in hydrofluoric acid systems, 11: 12682(J)

spectrophotometric analysis for trace amounts of S, 11: 11081

spectrophotometric determination, 11: 10812(R)

tissue distribution in rats, tracer study, 11: 1763(J)

volumetric determination in U–Zr fuel recovery samples, 11: 7945

Fluorides (liquid)

analysis for trivalent uranium, 11: 13704

corrosive effects of $LiF-UF_4$ and $NaF-UF_4$ on Mo, Nb, stainless steel, and Ni alloys, 11: 13762

dissolution of metals in fused baths, 11: 11052

heat capacity of LiF–KF, 11: 12977

vapor pressure for the system $NaF-ZrF_4$, 11: 5230(J)

volumetric analysis for U^{3+} using methylene blue, 11: 12974

Fluorimeters

design for analysis of small Ag-activated phosphate glass dosimeters, 11: 9018(J)

design of, for uranium, 11: 13270(J)

Fluorination

(See also Fluoride volatility processes.)

electrochemical, anodic mechanism, 11: 3724(J)

Fluorine

apparatus for handling, on a laboratory scale, 11: 10455

atomic weight, chemical determination, 11: 11096(J)

bibliographies of AEC reports, 11: 7956

chemical reactions with Cl_2O_6, 11: 7120(J)

chemical reactions with IF_5, kinetics, 11: 6270(J)

colorimetric determination in BeF_2, 11: 2290(R)

chlorination to ClF_3 at 280°C, 11: 2289

corrosive effects at elevated temperatures, 11: 13582(R)

corrosive effects on metals, alloys, and oxides, 11: 7184

corrosive effects on Ni, Cu, Monel, and Inconel at elevated temperatures, 11: 7408(R)

determination in boron fluoride–methyl ether systems, 11: 7434

Fluorine (cont'd)

determination in fluoroörganic compounds, 11: 3342(R)

determination in slags, calcined oxides, and U peroxides, 11: 1772

dissociation energy and electronic spectrum, 11: 9244(J)

electrochemical fission of C–F bond in halocarbons, 11: 5800(J)

explosive limits in mixtures of fluorocarbons, hydrocarbons, and water, 11: 8302

flow, measurement, 11: 6661

gasometric determination in plant gases, 11: 8304

microdetermination of traces in air, 11: 12684(J)

neutron total cross sections, 11: 1277(R), 4046(J)

solvent partition, 11: 13698(R)

production in cells, review of cells for, 11: 2288

protons scattered at 96 Mev by, energy spectrum, 11: 612(J)

purification, hydrogen fluoride removal equipment design, 11: 5254

spectrographic analysis, 11: 2259

thermodynamic properties, 11: 4319(J)

volumetric determination of μg quantities, 11: 5791(J)

wave functions for, 11: 11254(R)

Fluorine chlorates

preparation from reaction of F_2 on Cl_2O_6, 11: 7120(J)

thermal decomposition of $FClO_2$, 11: 7121(J)

Fluorine compounds

crystal structure, 11: 8541(R)

Fluorine generators

anode assemblies, materials for, 11: 142

Fluorine ions

polarization, effect of external fields on isolated, 11: 538

qualitative and semi-quantitative determination by drop method, 11: 11949(J)

Fluorine isotopes F^{17}

radiometric determination in Savannah River Reactor moderator, 11: 8839

Fluorine isotopes F^{18}

energy levels studied by $O^{17}(p,\alpha)N^{14}$ reaction, 11: 6145(J)

half lives, 11: 6865(R)

K-capture to positron emission in, ratio of, 11: 2074(J)

Fluorine isotopes F^{19}

angular distribution of proton groups from deuteron reactions (d,p), 11: 9491(J)

branching ratios and γ-ray spectra, 11: 605(J)

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

deuteron bombardment products of, magnetic analysis, 11: 615(J)

deuteron reactions (d,p) F^{20}, 11: 10761(J)

deuteron reactions (d,t) in, magnetic analysis, 11: 7339(J)

energy levels, 11: 605(J), 705(J), 6046(J)

energy level at 2.79 Mev excited by inelastic neutron scattering, 11: 8152(J)

gamma reactions (γ,n) near threshold, 11: 6865(R)

gamma spectra from (p,p'γ) reactions, 11: 5638(J)

induction decay shape in CaF_2, calculated, 11: 10694(J)

inelastic scattering between resonances, contribution of Coulomb excitation, 11: 2080(J)

magnetic moment of the second excited state, 11: 1299(J)

Fluorine isotopes F^{19} (cont'd)

magnetic properties in 197-ev nuclear level, 11: 2070(J)

neutron reactions (n,d) and energy levels in O^{18}, 11: 8156(J)

nuclear magnetic resonance in irradiated Teflon, 11: 10698(J)

nuclear magnetic resonance line shapes in CaF_2, 11: 10702(J)

nuclear magnetic resonance of, in CoF_2 and FeF_2, 11: 6881(J), 6882(J)

proton reactions (p,α), angular distribution and yield, 11: 4977(J)

proton reactions (p,α), parity conservation, 11: 13522(J)

proton reactions (p,α), pickup behavior, 11: 702(J)

proton reactions (p,$\alpha\gamma$), angular correlations, 11: 10325(J)

proton reactions (p,$\alpha\gamma$), γ rays from, 11: 7292(R)

proton reactions (p,p') and (p,α) and energy levels, 11: 1300(J)

proton scattering between 0.5 and 2.6 Mev, 11: 1680(J)

triton reactions (t,α) and (t,p), and energy levels of O^{18} and F^{21}, 11: 3055(J)

Fluorine isotopes F^{20}

energy levels from angular distribution of proton groups from deuteron reactions F^{19}(d,p), 11: 9491(J)

energy levels studied by F^{19}(d,p)F^{20} reaction, 11: 615(J)

spin, 11: 10761(J)

Fluorine isotopes F^{21}

energy levels in, studied by reaction F^{19}(t,p)F^{21}, 11: 3055(J)

Fluorocarbon–hydrocarbon systems

vapor pressure at 176°K, 11: 949(J)

Fluorocarbon polymers

effects of radiation and hot, pressurized water, 11: 1804

Fluorocarbons

explosive limits of F_2 in gaseous mixtures, 11: 8302

gamma reactions (γ,π^o), 11: 4115

phase studies of binary mixtures between 173 and 193°K, 11: 949(J)

preparation and properties, 11: 2286, 5799(J), 11650

thermal conductivity, 11: 11588

Fluoroform

hydrogen bond dissociation, 11: 1460(J)

Fluorohydrocarbon polymers

binders for U and F, 11: 8421

Fluoroörganic compounds

(See also Fluorocarbons; Perfluoroörganic compounds.)

analysis for F_2, bibliography, 11: 3342(R)

analysis for halogen impurities, 11: 2286

copolymerization with ketones, 11: 2844(R)

industrial applications, 11: 5799(J)

preparation and properties, 11: 11650

Fluoroörganic polymers

physical properties and structure, 11: 1455(J)

preparation and properties, 11: 7092(R)

Fluorox Process

development, 11: 7139(R), 7507(R), 7512, 7514(R), 8359(R), 11053(R), 12321(R), 12993(R), 12995(R)

equipment design and product purification, 11: 7511(R)

oxidation of UF_6 at 600°C, 11: 10836(R)

pilot-plant tests, 11: 8413

testing and fluidization studies, 11: 12965(R)

Fluorox Process (cont'd)

uranium hexafluoride scrubber studies, 11: 9666

Fluorspars

(See also Calcium fluorides.)

radioactive, mineralogy and paragenesis, diagnostic associates, appearance and radiation measurement of deposits, 11: 295(J)

Fluxmeters

design, 11: 5942

Fog

particle size measurement and chemical analysis, equipment, 11: 11077

Foils

(See also specific foils in the form Copper foils. See also Airfoils; Films; Metallic foils; Thorium oxide foils.)

neutron absorption in single and sandwich, 11: 1266

neutron fission and capture cross sections, reduction by foil self absorption and Doppler broadening, 11: 2625

neutron multiple interactions in resonant, 11: 3508(J)

silver, preparation of fine crystal, 11: 10145(J)

Food

(See also Diet.)

frozen, effects of exposure to radiation from nuclear explosion, 11: 3275

heat-sterilized, effect of container type on radioactivity and wholesomeness following nuclear explosion, 11: 7070

preservation of potatoes following radioinduced sprout inhibition, 11: 1401

radiation effects on wholesomeness, 11: 1723(R), 6597

radiation monitoring of, in Sweden, 11: 13248(J)

radioactively contaminated, effects on results in animal tracer experiments, 11: 7084(J)

radioactivity induced by exposure to atomic explosion, 11: 1752

radioactivity induced by neutron irradiation, 11: 5733

radioinduced flavor changes in, 11: 12643

radiometric analysis for Ra content, 11: 11929

radiosterilization, 11: 210(J), 829, 837(J), 1396(J), 1723, 2794, 3287, 3650, 3651, 4235(J), 5247(J), 5727(J)

radiosterilization, effects of bacterial radioresistance, 11: 7054(J)

radiosterilization, program in Europe in 1956, 11: 11903

radiosterilization, radiation facilities and economics of, 11: 11023(R)

radiosterilization, survey, 11: 11863(J)

radiosterilization of sliced apples, 11: 13233

sterilization, protection of sulfhrydryl group, 11: 6285(J)

Food irradiation facilities

calculations of production rate and dwell time, 11: 632

cost estimates, 11: 5293, 5910, 10594(J), 11023(R)

decontamination and waste disposal, 11: 225

design, 11: 628, 629, 631, 5007, 5293, 10594(J), 10746(J), 11023(R)

reactor core gamma radiation in, feasibility of using, 11: 630

reactor evaluation for, 11: 1655

Foote Mineral Co., Philadelphia

progress reports on low-Hf Zr production, 11: 7551(R)

Forest Home (Calif.)

uranothorites, geological exploration, 11: 3829(J)

Formaldehyde

preparation of C^{14}-labeled, 11: 8282(R)

Formates

metabolism by isolated rat tissues, tracer study, 11: 5183(J)

Formic acid

isotopic chemical effects, 11: 12970(R)

radiation chemistry, 11: 4277(R), 5136(R)

Formic acid–oxygen systems

decomposition by $B^{10}(n,\alpha)Li$ reaction and U^{235} fission recoils, 11: 11564(R)

Fort Union Formation (S. Dak.)

lignite deposits, 11: 4434

Fort Union Formation (Wyo.)

geology, 11: 12734

Fossils

age measurements by C^{14} methods, 11: 294(J)

Fourier transforms

code to invert the cosine, 11: 7259

integrals, numerical quadrature, 11: 480(J)

Fox Hills Sandstone (Wyo.)

geology, 11: 12734

France

atomic power program, 11: 3559(J)

Franklin Inst. Labs. for Research and Development, Philadelphia

progress reports, 11: 3425(R)

Fredonia Quadrangle (Ariz.)

photogeologic map, 11: 9317(J)

Free radicals

formation of stable, in solution by ionizing radiation, 11: 7132(J)

identification and spin resonance of organic, 11: 3330(R)

Freedom Mines (Utah)

uranium occurrence, 11: 10539

Freeze jackets

design for reactor fuel and coolant system maintenance, 11: 7861(R)

tests for Homogeneous Reactor Test, 11: 1318, 4537, 5294

Freons

proton and fluorine spin-lattice relaxation times, 11: 1650(J)

Frequency meters

design of, for measuring decrement of transverse oscillations in materials, 11: 5941

design of recording, 11: 8730(R)

Frequency modulation

design of system for cyclotrons, 11: 9560(P)

harmonic analysis of wave with periodic, 11: 2587

low level modulators, survey, 11: 8076

research at Massachusetts Institute of Technology, 11: 8025(R)

Frequency regulators

automatic tuning control for a cyclotron, 11: 2743

design for Nuclear Test Airplane, 11: 3469

Fretting corrosion

of reactor materials by high-temperature water, 11: 2904(J)

Friction

(See also Fluid flow; Gas flow; Internal friction; Surface friction.)

coefficient in non-lubricated clean mechanical device in clean water, 11: 3380

temperature relation to boundary lubrication, survey, 11: 254

Friction (cont'd)

testing, in moving parts in 200 to 500°F water environment, 11: 5303

theory, 11: 12510

Frogs

x radiation effect on, heart performance, 11: 1737(J)

Fuel alloys

See Reactor fuel alloys.

Fuel injectors

for internal combustion engines, tracer technique for study, 11: 9181(J)

Fuels

(See also fuels by name and Fluid propellants; Jet engine fuels; Reactor fuels; Solid propellants.)

Fungi

rust infection types, effects of irradiation, 11: 2795(J)

Furnaces

(See also Electric arc furnaces; Kilns; Resistance furnaces; Solar furnaces; Vacuum furnaces.)

casting, design of thermocouple-controlled, 11: 7654(R)

design, for converting U turnings to U_3O_8, 11: 9712

design for extended-surface heat transfer studies, 11: 6703(R)

design for melting Al–Ti–V alloy buttons, 11: 6394

design for melting and pouring radioactive metals, 11: 13334

design of oxidizing, 11: 5907(J)

design of small, high-temperature laboratory, 11: 9606

design of x-ray-diffraction, 11: 260

development of the aluminum burning radiant-type, 11: 11247

micro-, design for use in glove boxes, 11: 4383

multiple-crucible arc melting, design and operation, 11: 1909(J)

resistance, induction, and arc, for high-temperature materials, 11: 1861(J)

thermal gradient quenching, for fused salt phase analysis, 11: 4330(J)

temperature control by an electronic device, 11: 1027

for zone melting of U, 11: 6182(J)

Fused salt fuels

(See Reactor fuels (fused salts).)

Fused salt–liquid metal systems

distribution of U in, 11: 7734(R)

Fused salts

(See also specific compounds and systems.)

binary, electrical conductivity and complex formations in, 11: 96(J), 5191(J)

chromatography and spectrophotometry, 11: 4377(J)

complex formation in, 11: 10428(R)

corrosive effects on Ni, 11: 7408(R)

corrosive effects on U, 11: 10812(R)

electric conductivity, measurement, 11: 8284(R)

electrode-potential measurements, 11: 83(J)

electrolysis, bibliographies, 11: 12665

electrolysis for deposition of Ti coatings, 11: 3862(J), 5351(J)

electrolysis for separation of U, 11: 9254

electromotive forces of thermochains, 11: 5194(J)

graphite crucible for electrolysis of U halides in, 11: 5085(P)

heat capacity, estimation by empirical methods, 11: 10115(J)

Fused salts (cont'd)
heat capacity of LiF–KF, 11: 12977
melting point data for several systems, 11: 12666(R)
melts, thermodynamic properties and molecular structure, 11: 10460
phase studies, sample preparation for, 11: 4330(J)
phase studies of systems $FeCl_3$–KCl and $FeCl_3$–LiCl, 11: 7933
photometric analysis for metal ions, 11: 3332(J)
polarographs for recording polarization curves, 11: 1420(J)
reference electrodes for potential measurement, 11: 10431(R), 10432(R)
for refining of U, 11: 3226(P)
sodium and potassium thorium fluorides, phase diagrams, 11: 8852(J)
specific heats, 11: 3878(J), 13516(J)
spectrophotometric study of complex ions in, 11: 5278(J)
thermodynamic properties of solutions, 11: 387(J)
thorium production by electrolysis of, and properties of, 11: 5205(J)
volumetric analysis for U using methylene blue, 11: 12974

Fuses
thermal expansion data on BF_3 reactor safety, 11: 8692

Fusion
See Melting; Thermonuclear reactions.

G

Gabbros
density at high pressures, shock wave effects, 11: 5364

Gadolinium
activation state in phosphors, 11: 12145(J)
metallic phase transitions, 11: 8117(R)
neutron resonance cross sections, 11: 12888(R)
neutron total cross sections, 11: 1276(R)
physical and chemical properties, 11: 5816(J)
preparation from the oxide, 11: 12356
solvent partition in TBP–kerosene–U nitrate systems, 11: 10808
spectrographic determination, 11: 12973(R)

Gadolinium alloys
fabrication and corrosion of, for use as control rod materials, 11: 12356

Gadolinium chlorides
paramagnetic resonance, 11: 8229(J)

Gadolinium compounds
crystal structure of $NaGdF_4$, 11: 12341(R)
solid state reactions between, and various reactor matrix metals, 11: 13881

Gadolinium ions
complexing by fluoride ions in aqueous solution, 11: 11113(J), 11966(J)
crystalline cubic field splitting parameter in an S state, 11: 5387(J)

Gadolinium isotopes
formation by double neutron capture, 11: 7091(R)
preparation from cyclotron bombardment of Sm and Eu, 11: 2968

Gadolinium isotopes Gd^{147}
conversion electron spectrum relative intensities, transitions, 11: 2968

Gadolinium isotopes Gd^{149}
conversion electron spectrum relative intensities, transitions, 11: 2968

Gadolinium isotopes Gd^{149} (cont'd)
decay scheme, 11: 2968
gamma spectra, formed in a spallation reaction, 11: 12941

Gadolinium isotopes Gd^{151}
decay scheme, 11: 4814(R), 10361(J)

Gadolinium isotopes Gd^{152}
lifetimes, determination by method of delayed coincidences, 11: 8227(J)
radiation emission, 11: 1272

Gadolinium isotopes Gd^{153}
low-energy quanta from, coincidence arrangement for detection, 11: 1595(J)

Gadolinium isotopes Gd^{154}
internal conversion lines, 11: 4173(J)
lifetimes, determination by method of delayed coincidences, 11: 8227(J)
radiation emission, 11: 1272

Gadolinium isotopes Gd^{155}
internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

Gadolinium isotopes Gd^{156}
decay schemes, 11: 1278(R)

Gadolinium isotopes Gd^{157}
internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

Gadolinium oxide–samarium oxide systems
preparation, 11: 10887(R)

Gadolinium oxides
ceramic properties, 11: 3391(J)
sinterability at various temperatures in oxidizing and reducing conditions, 11: 970
thermal expansion coefficient from 30 to 840°C, 11: 7964

Gages
(See also Displacement gages; Pressure gages; Strain gages; Thickness gages; Vacuum gages.)
design, for curved surface measurement, 11: 3635(P)
design, for measuring space between parallel plates, 11: 9573(P), 12795
design, for measuring engine deposits, 11: 3798(J)
design, for small linear measurements of transformer, 11: 2573
operation of Pirani, for measuring beam collimation, 11: 1383(R)

Galenas
(See also Lead sulfides.)
flotation, 11: 3784, 4861(R)

Gallium
energy levels from Coulomb excitation, 11: 2090(J)
gamma spectra, 11: 2090(J)
K fluorescence yield, 11: 6517(J)
neutron total cross sections and resonances in kev region, 11: 4047(J)
nuclear quadrupole resonance, 11: 614(J)
reactions of non-metallics with, 11: 13763(R)
reactions with Be, Th, NaK, U, and U compounds at high temperatures, 11: 8461
solubility in $GaBr_2$, 11: 9217(J)
thermodynamic properties, 11: 11218

Gallium–antimony alloys
See Antimony–gallium alloys.

Gallium bromides

electric conductivity and activation energy, 11: 4275

Gallium chlorides

dielectric constant measurements, 11: 4810(R)

electric conductivity and activation energy, 11: 4275

Gallium chlorides (liquid)

viscosity, density, and surface tension, 11: 4274

Gallium–copper alloys
See Copper–gallium alloys.

Gallium fluorides

rotational analysis of bands of $Ga^{69}F$ and $Ga^{71}F$, 11: 4320(J)

Gallium halides

electric conductivity and activation energy, 11: 4275

Gallium iodides

electric conductivity and activation energy, 11: 4275

Gallium isotopes

relative abundance, 11: 1973(J)

Gallium isotopes Ga^{64}

half life, 11: 13114(R)

Gallium isotopes Ga^{65}

gamma spectra and coincidence measurements, 11: 9462(J)

half life and β spectra, 11: 9461(J)

Gallium isotopes Ga^{66}

nuclear angular momentum, 11: 6061

parity and electron polarization in $0 \rightarrow 0$ transition, 11: 13453(J)

spin and hyperfine structure, 11: 11363

Gallium isotopes Ga^{67}

energy levels, 11: 4710(J)

nuclear angular momentum, 11: 6061

spin and hyperfine structure, 11: 11363

Gallium isotopes Ga^{68}

energy levels, 11: 4710(J)

Gallium isotopes Ga^{69}

energy levels from decay of Ge^{69}, 11: 4989(J)

nuclear quadrupole resonance spectrum, 11: 9251(J)

Gallium isotopes Ga^{70}

decay properties, 11: 4176(J)

neutron reactions, 11: 1278(R)

Galvanometers

design and construction of electromechanical analog for study of strong focusing betatron orbits, 11: 3119

Gamma-absorption analysis

steam-water ratio in tubes measured by, 11: 6783

Gamma absorption coefficients

for lead and polyethlene slabs, calculated by Monte Carlo method, 11: 2162

Gamma absorption cross sections

shell model calculations, 11: 10709(J)

Gamma cross sections

isotopic spin impurity effects on (γ,p) and (γ,n), 11: 4999(J)

Gamma decay

empirical regularities in, comparison with predictions of nuclear models, 11: 3602

Gamma radiation

(See also Photons; X radiation.)

Gamma radiation (cont'd)

absorption by shielding, energy from, 11: 1618(R)

absorption in beryllium, graphite, aluminum, and copper, 11: 5979(J)

absorption in lead and polyethylene slabs, 11: 2162

absorption in rubber square slabs, 11: 2161

absorption in water, iron, lead, and Fe–Pb combinations, 11: 760(J)

absorption in water-iron shield calculated by integral network theory, 11: 4181, 5677

absorption kernels in reactor core and reflector, 11: 11001

activity concentration from rough ground, mathematical analysis, 11: 1378

air scattering from Co^{60}, detection and measurement, 11: 11329

angular correlation analysis in nuclear bombardment experiments, coefficients for triple, 11: 9051

angular correlation in the 2.86-0.72-Mev cascade in B^{10}, 11: 1298(J)

angular correlation measurement, design of 4-scintillator detector for, 11: 5449(J)

angular correlations in $Si^{28}(d,p\ \gamma)Si^{29}$ reaction, 11: 1353(J)

angular correlations in the two-photon Compton effect, 11: 10349(J)

angular distribution, apparatus for measuring, 11: 12068(R)

angular distribution and angular correlation from proton capture in Mg^{24}, 11: 709(J)

angular distribution and polarization of, from Coulomb excitation, 11: 4016(R)

angular distribution from an assembly of oriented nuclei, 11: 12859(J)

angular distribution of, from reaction $N^{14}(p,\gamma)O^{15}$, 11: 6548(J)

angular distribution of, from reaction Na^{23} (p,γ) Mg^{24}, 11: 1346(J)

angular distribution of, quanta in positron annihilation, 11: 3514(J)

applications in processing commercial products, technical and economic aspects, 11: 3873

attenuation, 11: 7842(R)

attenuation, when streaming through a cylindrical duct, calculation, 11: 10659(J)

biochemical effects, 11: 4781(R)

biological effects compared with effects of β particles in mice, 11: 6609(J)

biological effects compared with effects of fast neutrons on mice, 11: 6608(J)

biological effects compared with effects of x radiation in production of chromosomal aberrations in Tradescantia, 11: 7049(J)

biological effects on food, 11: 12643

biological effects on humans, 11: 2235, 2236, 4787(J)

cellulose degradation induced by exposure to, 11: 6673(J)

chain reaction stimulation in oxidation processes of paraffin, 11: 5812(J)

changes in serum albumin following exposure, 11: 6603(J)

chemical effects in (γ,n) reaction, review, 11: 5807(J)

collimator and expansion chamber for, 11: 8096(J)

conversion to heat in reactor shielding, 11: 9894

conversion to heat in reactors, 11: 9823

degradation spectra, approximate expression for, 11: 13534(J)

detection and measurement, 11: 56, 1379(J), 1579, 2603, 2941(J), 3489(J), 3958, 5962, 6471, 6473(J), 6591(P), 11821, 13565(R)

detection and measurement, CdS cells for, 11: 509(J)

detection and measurement, design and performance of a scintillation counter, 11: 3955, 4584(J)

detection and measurement, design and performance of survey equipment, 11: 1559, 2978, 3476, 3953, 3956

Gamma radiation (cont'd)

detection and measurement, design of a continuous monitor for U analysis in TBP process streams, 11: 11737

detection and measurement, design of rate meter for, 11: 10658(J)

detection and measurement, design of well-bottom container for, 11: 10653(J)

detection and measurement, from fall-out, time of arrival device for, 11: 11330

detection and measurement, performance of alkali halide crystals for, 11: 1249(J)

detection and measurement, performance of halogen quenched Geiger counters, 11: 2977

detection and measurement, performance of immersion counter for use with solutions, 11: 4566

detection and measurement, performance of scintillation detector, 11: 510(J), 10175, 10195(J), 11326

detection and measurement by CdS-crystal rate meters, 11: 486(R), 7276(J)

detection and measurement by chemical dosimeters, 11: 505(J), 1594(J), 12517(R)

detection and measurement from fall-out samples from Operation Castle, 11: 10650

detection and measurement in biological materials, performance of scintillation counter, 11: 8083(J)

detection and measurement in flowing liquid, 11: 3481

detection and measurement in JEEP Reactor using nuclear emulsions, 11: 11414

detection and measurement in presence of β particles, 11: 10171

detection and measurement of, for nuclear spin determinations, 11: 11358

detection and measurement of, from fall-out, 11: 12292(J)

detection and measurement of, from radioactive materials in soil and rock, 11: 7075(J)

detection and measurement of, from spent fuel assemblies, 11: 12515

detection and measurement of natural background, in rocks, 11: 493(J)

detection and measurement using A–He–NH_3-filled detector, 11: 9546(P)

determination of intensities of, influence of longitudinal angular dependence of photoelectric effect, 11: 10593(J)

diffusion in water, energy and angular distribution, 11: 1618(R)

detection and measurement in human subjects, 11: 1593(J), 7268(J), 7291(R)

dosage determinations, 11: 482, 520, 836, 1725(R), 2597, 2752, 4014, 4781(R), 6474(R), 8764, 12517(R)

dosage determinations around multiple γ-ray sources, 11: 6821(J)

doses in fall-out calculated from β activity, 11: 9508

dosimetry, calibration of chemical radiation detectors, 11: 9576(R)

dosimetry of kilocurie sources, 11: 11321

effects of chronic low dose exposure on blood picture and susceptibility to bacterial infection in mice, 11: 12641

effects of whole-body exposure on respiratory pattern in monkeys, 11: 6606(J)

effects on aqueous methylene blue conjugated reactions, 11: 962(J)

effects on bacteria, 11: 847(J), 1733(J), 4236(J)

effects on chromatographic behavior of blood serum proteins, 11: 11849(J)

effects on desoxyribonuclease activity in isolated mitochondria, 11: 9924(J)

effects on development of broad bean roots, 11: 7063(J)

effects on dithizone in organic solvents, 11: 7129(J)

effects on formation of tetanus antitoxin in mice, 11: 5150(J)

Gamma radiation (cont'd)

effects on growth of roots, dependence on oxygen and temperature, 11: 11859(J)

effects on incorporation of Fe into erythrocytes, 11: 5138

effects on military specifications greases, 11: 4851

effects on mineral density and refractive index, 11: 4168(J)

effects on physical properties of elastomers, 11: 12894

effects on potassium chloride solutions, 11: 1803(J)

effects on proteins and amino acids, 11: 1736(J), 6283(J)

effects on sedimentation characteristics of blood serum proteins, 11: 11848(J)

effects on testes and germ cells in the rat, 11: 11866(J)

effects on vitamin C content in potatoes, 11: 11853(J)

elastic and inelastic resonance scattering on nuclei, analysis, 11: 10696(J)

elastic scattering, contribution of electric field of nuclei to, 11: 6946(J)

elastic scattering from Pb, Bi, and U at 2.62 Mev, 11: 3186(J)

emission after thermal neutron capture, 11: 591(J), 710(J), 711(J)

emission from high-energy π-meson reactions with nuclei, γ-quantum diffraction emission, 11: 2167(J)

emission from strange particles, 11: 1261(J)

energy absorption coefficient, 11: 11000

energy and angular distribution of, from Co^{60} source after diffusion through water, 11: 12285

half-thickness values in Pb, 11: 7091(R)

heat production by, in slabs, 11: 7843(R)

heating of reactor shields by fast neutron capture, 11: 8687(R)

inactivation of cholinesterase induced by, 11: 4244(J)

inelastic scattering by Au^{197}, 11: 611(J)

inelastic scattering from the bound electrons of heavy elements, theory, 11: 8211(J)

insect control by exposure to, 11: 6202(J), 6203(J)

intensity measured by apparatus with logarithmic scale, 11: 6830(J)

internal conversion dependence on nuclear structure in electric multipole transitions, 11: 11349

internal conversion in K shell, tables of coefficients, 11: 6511(J)

lethal dosage determinations for rats, 11: 10395

lifetimes of low-energy El transitions in odd mass spheroidal nuclei, 11: 6498

measurement of anisotropy and polarization of, emitted by Mn^{52} nuclei, 11: 11483(J)

measurement of correlation between beta rays and circularly polarized, in Co^{60}, Zr^{95}, and Sb^{124}, 11: 13485(J)

measurements of, from fall-out by automatic recording monitors, 11: 9404

from neutron inelastic scattering, 11: 591(J)

from neutron inelastic scattering in C, Fe, B, F, Al, Pb, Zr, Fe^{54}, Fe^{56}, Cr, Cu, Hf, Ni, Te, Tl, and W, 11: 6856

nuclear reactions (γ,p), associated with formation of ground state nuclei, 11: 4128(J)

nuclear reactions induced by bremsstrahlung, calculation of effective cross sections, 11: 2061(J)

nuclear stars produced by, 11: 4031(J)

oxidation of tellurous acid by, 11: 1806(J)

pair production, 11: 1251(J), 3509

pair production by Be^8, in photographic emulsion, 11: 8967(J)

pathological effects, 11: 8764

pathological effects in mice, 11: 11841(R)

Gamma radiation (cont'd)

pathological effects in mice, influence of paired doses, 11: 7910(R)

pathological effects of chronic exposure on mice, 11: 9915(R)

pathological effects of extended exposure on swine and burros, 11: 11021(R)

pathological effects on laboratory animals, 11: 30(J), 833, 871(J), 2237, 2779(R), 2789, 3280(J), 4226(R), 4253(J), 4785(J), 5134(R), 5156(J)

pathological effects on monkey brain cells in tissue cultures, 11: 7908

pathological effects on plants, 11: 855(J), 1740(J), 5155(J), 5257(J), 6193(J)

pathological effects on spleen lymphoid tissue in mice, 11: 9928(J)

pigmentation induced in mice by exposure to, 11: 7910(R)

polarization of, emitted from nuclei capturing polarized neutrons, 11: 5044(J)

postirradiation creatinuria in rats exposed to, 11: 11874(J)

protective measures against, 11: 1712(P), 10415(J)

radiobiological effects compared with effects of fast neutrons on mice, 11: 5165(J)

radiolysis of hexane induced by, 11: 6676(J)

resonance absorption by nuclei, 11: 1542(R)

scatter component measurement from Co^{60}, 11: 9947

scattering, 11: 1542(R), 2110, 2748, 2751, 4012, 5015, 5655(J), 6135(J)

scattering, circular polarization analysis, 11: 9054(R)

scattering (multiple) at 0.05 to 10 Mev, theory, 11: 7356(J)

scattering by copper, 11: 6949(J)

scattering by protons up to 120 Mev, 11: 6135(J)

scattering by soil, 11: 3187(J)

scattering by tin at 1.33 Mev, 11: 6945(J)

scattering cross sections by protons below neutral meson threshold, 11: 9069

scattering from 0.05 to 10.0 Mev, 11: 7356(J)

scattering from thick slabs, 11: 2751

scattering in air, 11: 13532

scattering in water, calculation of multiple, 11: 8736

scintillation detection of very-low-energy, 11: 6819

self-scattering effect on yield of radiation along cylindrical source, 11: 13547(J)

shielding properties of Navy barracks, 11: 6210

streaming through cylindrical voids in water, 11: 13884(R)

techniques for measurement of efficiency of detector, 11: 6856

transmission and emission, mathematical analysis, 11: 2748

transmission of obliquely incident, through stratified slab barriers, 11: 4182

transmission through holes in water shields, 11: 13885(R)

tumor induction following exposure of rats, 11: 6610(J)

from Zn^{65}, nuclear and annihilation intensity relations, 11: 8218(J)

Gamma shielding

calculations for Homogeneous Reactor Test chemical facility carrier, 11: 4086

conference proceedings, Naval Radiological Defense Lab., Oct., 1956, 11: 10365

design for Liquid Metal Fuel Reactor, 11: 12221, 12222

effectiveness of lead and water, 11: 10586

effectiveness of various materials, 11: 6970(J)

energy flux, dose rate, and buildup factors in Pb–H_2O slab, Monte Carlo calculation, 11: 4181

equation for, graphical solution to, 11: 8232

Gamma shielding (cont'd)

gamma transmission through stratified slab barriers, 11: 4182

geometrical attenuation determination, 11: 1701(J)

liquid, containing randomly packed pellets, effect of neutrons on, 11: 2767

materials, comparison of boric acid solution and water, 11: 14033

materials, survey, 11: 12639(R)

mathematical design study, 11: 13212

requirements for 10-c Co^{60} source, 11: 790(J)

Gamma sources

(See also X-ray sources.)

calibration, 11: 13565(R)

calibration, production, and properties, 11: 6571

calibration of, ionization chamber design for, 11: 5962

calibration of radioactive tantalum wire for radiotherapy, 11: 4940(J)

a comparison of Cs^{137}, concentrated anhydrous mixed fission products, and cooling reactor-fuel element, 11: 5293

cost factors, 11: 3873

design, 11: 2779(R), 3738(J)

design of Co^{60}, 11: 1700(J), 3207(J), 3613(J)

design of Co^{60}, for radiotherapy of lip cancer, 11: 6623(J)

design of Co^{60}, for therapeutic use, 11: 6625(J)

design of compact portable unit, 11: 11543(P)

design of high intensity, 11: 7091(R), 10586, 10588

design of industrial, using spent Materials Testing Reactor fuel elements, 11: 10595(J)

design of megacurie Co^{60}, 11: 1377, 6153(J)

design of semimobile Co^{60}, 11: 3616(J)

design of 60-curie Co^{60}, 11: 9510(J)

energy distribution of quanta from point, in infinite sandy medium, 11: 5523(J)

dosage determinations for Co^{60}, 11: 9398

dosage determinations from Co^{60} and Cs^{137}, 11: 1467

dosage determinations for Co^{60} teletherapy unit, 11: 5981(J)

dosage determinations from cylindrical Co^{60}, 11: 3207(J)

homogeneous reactors as, feasibility, 11: 7813

indium loops and reactor cooling water, evaluation as, 11: 14027

industrial uses in radiosterilization of foods, 11: 11023(R)

installation of Co^{60}, 11: 5525(J), 6153(J)

preparation for radiography of steel, 11: 4449, 11311(J)

preparation from spent Materials Testing Reactor fuel elements, 11: 6105(J)

preparation of Am^{241}, 11: 769

preparation of irradiated polymers for use as, 11: 1802(J)

production, handling, and distribution, 11: 520(J)

production in reactors, for food irradiation facilities, 11: 1655

radiotherapeutic effectiveness of kilocurie Co^{60}, 11: 59(J), 60(J), 11900(J), 13251(J)

self-scattering effect on yield of radiation along cylindrical source, 11: 13547(J)

shielding for 10-c Co^{60}, 11: 790(J)

survey, 11: 12087(J)

Gamma spectra

in crystals, techniques for analysis, 11: 734

Gamma spectrometers

anticoincidence scintillation, for analysis of fission-product mixtures, 11: 12504(R)

application to analysis of radioisotope mixtures, 11: 1438

calibration, 11: 11324

combination β-, design, 11: 8088(J)

comparison of scintillation and magnetic, 11: 2072(J)

coincidence or 2 separately monitored, 11: 1272

design, 11: 3483

design for analysis of U in process solutions, 11: 1023

design for Hanford coolant water monitoring, 11: 13852

design of bent crystal, transmission type, for studying neutron capture reactions, 11: 2975

design of coincidence, 11: 10648

design of simple recording, 11: 10661(J)

development of bent crystal, 11: 550(R)

double crystal luminescence type, design, 11: 8089(J)

instrumentation, 11: 1618(R)

lead glass Cherenkov radiation, 11: 9019(J)

magnetic, with improved focusing, design, 11: 798(J)

resolution and efficiency of 3 crystal, 11: 7292(R)

response of total absorption scintillation, 11: 4582(J)

single crystal scintillation, calibration and measurements of γ emitter mixture, 11: 10195(J)

two-meter crystal diffraction, design, 11: 3485(J)

Gamma spectroscopy

analysis techniques for crystal, 11: 734

methods in neutron capture, 11: 550(R)

review of high- and low-energy, 11: 6482(J)

techniques of low-energy scintillation, 11: 4581(J)

techniques using Xe-filled proportional counter and NaI scintillation counters, 11: 5451(J)

Ganglionic blocking drugs

radiosensitivity effects in mice, 11: 12961(R)

Gas analyzers

design for determination of F_2 in plant gases, 11: 8304

design for H_2 analysis, 11: 2272

Gas-ceramic systems

See Ceramic-gas systems.

Gas cooled reactors

(See also specific gas cooled reactors, e.g., BEPO; Brookhaven Reactor; Calder Hall reactors; Daniels Power Reactor; GLEEP; ORNL Graphite Reactor; Saclay Reactor; SLEEP Reactor.)

characteristics, 11: 6928(J)

chemical problems of coolant, 11: 11442(J)

comparison with sodium graphite, for producing electricity, 11: 3557

design and development of high-temperature, 11: 13961

design for merchant vessels, 11: 12901

development, status, 11: 2775(J)

fuel element design for Belgian BR-I enriched U, 11: 6906

fuel element loading and unloading apparatus for, 11: 11528(P)

heat transfer, 11: 5832(J)

heat transfer in, effects of coolant properties and channel design, 11: 5839

helium cooling, 11: 2633(R)

Gas cooled reactors (cont'd)

helium cooling, pressure drop calculations for, 11: 8661

helium cooling of Be-moderated, for closed-cycle gas turbine power plant, 11: 13915

leak detection in, 11: 681(J)

maintenance, 11: 10280

performance, effect of cooling gas pressure and reactor dimensions, 11: 12906(J)

slug rupture detection, 11: 5037(J)

Gas flow

(See also Compressible flow, Convection; Incompressible flow; Liquid flow; Stack disposal; Subsonic flow; Supersonic flow.)

between impact wave and laminar, spherical, and cylindrical boundary, 11: 4528(J)

boundary layer control with porous materials, 11: 7169

control using flowmeters, 11: 6661

heat exchange and hydraulic resistance in high-speed, calculations, 11: 1046(J)

heat transfer and hydrodynamic characteristics, 11: 11817

heat transfer to small cylinders in high temperature subsonic, 11: 12722

in mass spectrometer inlet system, thermal transpiration, 11: 1573

measurment, design of thermal flowmeter for, 11: 8551

methods of measurement of shock waves, bibliographies, 11: 4411

oscillating, heat transfer in, 11: 239

pressure measurement probes, theory of free-molecule orifice-type for isentropic and nonisentropic, 11: 11165

shock wave front parameters in point-source blast, 11: 3903(J)

strong explosions approaching spherical, theory, 11: 3902(J)

supersonic, past circular cylinder, mathematical analysis, 11: 9280(J)

surface mobility effect on gas phase transport through porous media, theory, 11: 11249

theory, solution of integral equations with probability kernels, 11: 4415

theory of Knudsen flow, 11: 5404, 5405, 12250, 12789

tortuous system, mathematical analysis, 11: 12721

unsteady, equations for in gravitational masses, 11: 9281(J)

velocity measurement and automatic control with tagged isotopes, 11: 241(J)

Gas flow (laminar)

boundary layer of compressed, on plate in wide range of temperatures, mathematical analysis, 11: 246(J)

measurement by colorimetric method, 11: 252(J)

Gas flow (turbulent)

expansion in medium of different density, 11: 250(J)

in rocket nozzle, behavior, 11: 1032(R)

Gas Hills Uranium District (Wyo.)

geologic map, 11: 1088(J)

Gas-liquid systems

expansion, studies by gamma absorptiometry, 11: 13375(J)

Gas turbine engines

heat transfer between components, 11: 10514(J)

temperatures and stresses in hollow blades for, 11: 12008(J)

Gaseous Diffusion Plant instrumentation (electronic)

fluorine analysis in plant gases, 11: 8304

Gaseous diffusion plant seal systems

manual, 11: 12442

Gaseous diffusion plants

criticality studies of product storage, 11: 12633

efficiency, equilibrium time for a square plant, 11: 8986

operation modes with split cascade, 11: 2224

productivity, loss due to periodic feed concentration, 11: 12799

safe interaction criteria for containers of fissionable materials, 11: 13832

uranium recovery from cleaning solutions, 11: 5288(J)

Gaseous Diffusion Process

cascade splits in, operation modes with, 11: 2224

cascade studies, calculation of 4-component system, 11: 8865

continuous cascade scheme, 11: 9379(J)

linear programming model as applied to separation of U isotopes, 11: 4558

paralleling of cascades, 11: 2886

separation, equilibrium time for a square plant, 11: 8986

Gaseous fuel reactors

criticality of, with reflectors of D_2O, Be, and C, using UF_6, 11: 13956

design of fission-plasma for direct power production, 11: 10749(J)

Gaseous ions

passage of H^+, He^+, C^+, and O^+ through silver foil, energy loss measurements, 11: 10145(J)

Gaseous reactions

activated by nuclear processes, 11: 12860(J)

involving He metastable atoms and resonance photons, 11: 11295(J)

Gases

(See also Plasma; Rare gases.)

analysis and analytical techniques, 11: 5917(J)

analysis of vent, from fractionation unit, 11: 10904

arc column deformation in rarefied, at high currents, 11: 1943(J)

backscattering of β particles from, 11: 11465(J)

bubble size in liquids, measurement, 11: 446(J), 461(J)

catalytic oxidation of radiolytic, on ThO_2 slurries, 11: 4265

chemical reactions, kinetics, 11: 4530(J)

chromatographic separation and analysis, 11: 113(J), 933(J)

collision operator for Lorentz, 11: 2957(J)

current contractions in fast and intense discharge, 11: 431(J)

decontamination, particle conditioning techniques for high separation efficiencies in, 11: 8434(R)

decontamination of, seminar on, 11: 2473

density during discharge, measurement with probes, 11: 8055(J)

detection and analysis for concentrations of O_2, design and performance of instrument for, 11: 2271

determination in Mo, W, and Nb, 11: 10445(J)

diffusion, determination by halogen sensitivity of positive ion emitters, 11: 7291(R)

diffusion and adsorption rates obeying the Elovich equation, 11: 5938(J)

diffusion at high pressures, equipment for study, 11: 11292

diffusion of ionized, across a magnetic field, 11: 1215, 5399(J)

electric discharge in, x radiation accompanying, 11: 434(J)

electric discharge in strong current longitudinal magnetic field, 11: 11287(J)

emission spectra, effects of composition, pressure, and spark gap, 11: 10612(J)

equations of motion for ionized, 11: 7227

Gases (cont'd)

equation of state, 11: 6633

electric discharge, electron concentrations and collisions with atoms in, 11: 8062(J)

evolution from irradiated electrical power cables, 11: 13629

evolution in straight-through homogeneous reactors, 11: 7753

explosive limits of H_2–air–nitrogen oxide mixtures, 11: 12105

fission, filtration of, 11: 11975

fluorescence due to fast particles, spectroscopic examination, 11: 1216(J)

formation, effect of neutron irradiation, 11: 3577

formation of radioactive, in atomic plants, survey, 11: 395(J)

free energy functions for gaseous elements, tables of, 11: 12106(J)

halogen, negative ion formation following exposure to ionizing radiation, 11: 1581

heat transfer, 11: 11669

heat transfer between single cylinders with large temperature difference, 11: 6707(J)

hydrodynamic properties and mathematical analysis of ionized low density, in magnetic field, 11: 12790

ion pair production in, determination of energy for, 11: 9370(J)

ion stopping cross sections, 11: 550(R)

ionization apparatus, 11: 7039(P)

ionization of mixtures by Pu^{239} α particles, 11: 6677(J)

ionized, statistical mechanics and oscillations, 11: 444

isotope effect and product composition of pyrolysis of PbC_2O_4, 11: 6643(J)

light emission from α-particle stopping in, 11: 1274(R)

liquefaction cycles, parameter calculation for low pressure, 11: 13374

mass spectrographic analysis, 11: 10907

neutron scattering by, angular averages in, 11: 4729(J)

oscillations of infinite self-gravitating cylinder in magnetic field, 11: 12782(J)

permeation through electrolytic Ni deposits, 11: 1959(J)

physical properties, 11: 11669

physical properties of mixtures of D_2, O_2, and He at high temperature and pressure, 11: 7784

plasma pulse in cylinder, mathematical analysis, 11: 12781(J)

positron annihilation in, 11: 6864

positronium formation in, 11: 3515(J)

pressure and internal energy, generalization for Thomas-Fermi atom model, 11: 1958(J)

production in Homogeneous Reactor Test pressurizer, purge rate for, 11: 2669

properties, design of all metal systems for studying, 11: 6666(J)

properties of ionized low-density, 11: 13376(J)

proton collisions with, formation of negative H ions by, 11: 2177(J)

radiation from, theory, 11: 4525

radiative transfer theory applied to Knudsen flow, 11: 10611

radioactive applications in surface studies of materials, 11: 2959(J)

radioactivity of, from Homogeneous Reactor Test fuel storage tanks, 11: 10944

safety device for explosive, 11: 462(J)

sampling, equipment, 11: 8792(R)

sampling under pressure, 11: 7946

scattering of particles by, equations for angular distributions in, 11: 8203(J)

Gases (cont'd)

secondary electrons in, device for study, 11: 5402

separation from Homogeneous Reactor Test solutions, design and performance of equipment, 11: 7794

separation in Homogeneous Reactor Test fuel system, 11: 9816

separation theory, 11: 7972(J)

separators for, for use in Homogeneous Reactor Test, 11: 8586

separators for, in the Intermediate Scale Homogeneous Reactor, calculations of length, 11: 7782

shock compression of perfect, 11: 8068(J)

shock waves in, effects of magnetic field, 11: 6746

solubility measurement device and technique, 11: 7239(J)

solubility in biphenyl, 11: 3783(R)

solubility in Cu, effect of vacuum on, 11: 1520

solubility in organic moderator coolants, 11: 4407(R)

solubility of solids in, 11: 8029(J)

specific heat of degenerate electron, 11: 3459

spectra of high-frequency discharges, 11: 10613(J)

spectrometric determination in metals, equipment design, 11: 4469

spectroscopic analysis of combination scattering, 11: 4186(J)

spectrum analysis of mixtures, use of pulse discharges for, 11: 11294(J)

stability of ideal conductor in external magnetic field, 11: 11287(J)

stopping power for Li^+, 11: 1960(J)

strong impulse discharges in, 11: 1961(J)

temperature measurement for reactor coolant, 11: 10149

temperature measurement of, using change of pitch of sound, 11: 9558(P)

temperature measurements by thermocouples, corrections to, 11: 2963

thermal conductivity and viscosity at high pressure, estimation, 11: 4526

thermal conductivity of electronically excited or chemical reacting, theory, 11: 7237

thermal conductivity of Ne–A, Ne–Kr, and A–Kr mixtures, 11: 6778(J)

thermal expansion studies on BF_3, 11: 8692

Thomas-Fermi equation of state of dilute, graphs, 11: 6975

transport properties, 11: 10020(J)

virial coefficients, approximate formula for, in Lennard-Jones 6-9, 11: 2560

viscosity of mixtures at high pressures, 11: 1213

x radiation from pulse discharge, 11: 432(J)

Gasket materials

physical properties, effects of radiation on, 11: 12691

for radiochemical plants, radiation effects, 11: 1374

Gaskets

(See also Pipe joints; Seals and glands.)

corrosion in Homogeneous Reactor Test, 11: 4088

design and leak rates of flexitallic, for mechanical closures, 11: 2542

design of improved metal, for vacuum systems, 11: 3931(J)

gold, sealing and corrosion properties, 11: 6344

leakage detection, 11: 2541

life expectancy of elastomer, in Materials Testing Accelerator shielding, 11: 8744

neoprene, leaks, 11: 448(R)

preparation and testing of Ti-lined pipe for standard ring-joint, 11: 3843

for three- and four-way values, testing, 11: 14020(R)

Gasometric analysis

design of high vacuum system for Pu, U, and Zr, 11: 3339

Gassaway Member (Tenn.)

reserves of U in, of Chattanooga shale, Youngs Bend Area, 11: 3406

Gastrointestinal tract

function in rats, effects of chronic absorption of Ce^{144}, 11: 3283(J)

function in rats, effects of exposure to x radiation and thermal neutron column, 11: 865(J)

methionine absorption from, effects of radiation sickness, 11: 2800(J)

radiation effects on esophagus, 11: 6206

radiation effects on gastric emptying time in dogs, 11: 3280(J)

radiation injury from ingested Ru^{106}, Ce^{144}, Sr^{89}, and Sr^{90} in rats, 11: 9930(J)

radioinduced changes following local irradiation of dogs, 11: 7912(J)

radiosensitivity, 11: 8258(R), 8768(J), 12960(R), 12961(R)

Gateway District (Colo.)

preliminary geologic map of western part, 11: 10544(J)

Gating systems

design of linear, 200 mμ sec duration, 11: 4949(J)

design using two vacuum tubes and two crystal diodes, 11: 7028(P)

for low voltage pulses, 11: 5108(P)

Geiger-Mueller tubes

(For detection instruments using Geiger-Mueller tubes see also Radiation detection instruments (pulse type).)

behavior of Br-quenched, 11: 11332(J)

design and performance for investigation of external electrostatic fields, 11: 12159(J)

design for operation at low potentials, 11: 8543(R)

design giving definite counting length, 11: 6837(J)

design modifications for counting radioactive compounds directly on paper chromatograms, 11: 1097(J)

design of In foil cathode for neutron flux measurement, 11: 497(J)

design of windowless, 11: 12330(R)

geometry factors, 11: 2553(R)

monolayer adsorption measured directly by, 11: 3883(J)

nomographs for resolving time corrections of, 11: 7843(R)

performance of halogen-quenched, 11: 1581, 3971(J), 6826(J)

performance of, in x-ray analysis, 11: 1601(J)

quench gas decomposition, 11: 4573(J)

General Electric Co. Hanford Atomic Products Operation, Richland, Wash.

environs monitoring, 11: 11877(R)

General Electric Co. Specialty Transformer Dept., Fort Wayne, Ind.

progress reports, 11: 12791(R), 12792(R), 12793(R)

progress reports on biology research, 11: 11877(R)

progress reports on high energy storage ceramic capacitor, 11: 11242(R), 11243(R)

progress reports on nuclear physics, 11: 8116(R)

progress reports on physics research, 11: 1275(R), 2116(R), 4013(R), 5493(R)

progress reports on Pu recycle program, 11: 11410(R)

progress reports on radioactivity levels of Columbia River, 11: 1747(R), 1748(R), 3297(R), 9202(R)

progress reports on radiological sciences activities, 11: 2242(R), 8257(R), 11556(R)

progress reports on reactor development, 11: 11408(R)

progress reports on underground pipelines and structure corrosion, 11: 4429(R)

General Electric Co. Research Lab., Schenectady, N. Y.

progress reports, 11: 1132(R)

progress reports on physical metallurgy, 11: 3427(R)

Generators

(See also specific types of generators, e.g., Aerosol generators; Fluorine generators.)

homopolar, design, 11: 10921(R)

modified CO_2, for gasometric determination of small amounts of nitrates and sulfamites in the presence of foreign ions and diluents, 11: 2266

test procedures for Homogeneous Reactor Test, 11: 8644

Genetics

applications of radiation in studies on, 11: 5753(J)

effects of ionizing radiations on populations of Collembola, 11: 13245(J)

effects of radiation on natural microbial populations, 11: 847(J)

human, review, 11: 11862(J)

human population studies, 11: 12635

hybridization effects on radiosensitivity of mice, 11: 11852(J)

influence of strain differences on radiosensitivity of mice, 11: 5728(J)

plant breeding studies, 11: 5130

radiation effects on crossing over, 11: 8773(J)

radiation effects on hereditary factor of man, 11: 11860(J)

radioinduced mutations in yeast, 11: 11843

radioinduced plant mutations, application in breeding programs, 11: 8762

significance of radiation exposures in atomic energy work, 11: 4787(J)

x-radiation effects on embryogenesis in early stages, 11: 1735(J)

Geneva Conference Reactor (GCR)

(See Swimming Pool Reactors.)

Gentisic acid

analytical uses for selective elution of Be from Dowex-50 resin, 11: 7974(J)

Geology

age measurements, 11: 5374(J)

Geophysical prospecting

(See also Geophysics; Rock drilling; Well logging.)

progress reports in geologic investigations of radioactive deposits in U. S. and Alaska, 11: 10084(R)

resistivity data from electric well logging, 11: 8913

use of radioisotopes in oil-, 11: 10583(J)

Geophysics

(See also Geology; Geophysical prospecting.)

aging of deep sea sediments for a million years, measurement by Be^{10} method, 11: 13366(J)

Georgia Inst. of Tech., Atlanta. Engineering Experiment Station

progress reports on high-temperature materials, 11: 11179(R)

Germanium

cesium ion penetration, 11: 9347(J)

crystalline lattice deformations induced by fast electron bombardment, 11: 2955(J)

dislocations, band structure, transport properties, and impurity levels, 11: 4499(J)

electrical and optical properties of, for use in solar batteries, 11: 801(J)

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

neutron irradiation effects, fast, 11: 9156

neutron total cross sections, 11: 1277(R), 2085(J), 4046(J)

normal and gold-doped, effects of fast neutrons on, 11: 12504(R)

Germanium (cont'd)

permanent-mold casting of thin, monocrystalline plates, 11: 10582(J)

radiation damage, 11: 8548(R)

radiation damage, diffusion-limited annealing, 11: 11475(J)

radiation effects, 11: 1922(R)

radiation effects and electric properties, 11: 8747(R)

secondary electron emissions from solid and liquid, 11: 1954(J)

thermodynamic properties of Ge_2, 11: 11218

thermoelectric power from fission energy, 11: 2546

Germanium compounds

properties of mannitogermanic acid, 11: 11064(J)

Germanium crystals

atomic displacement produced by α particles, 11: 9160(J)

radiation effects on diodes, 11: 13866(R)

radiation effects, disordering by alpha particles in n-type, 11: 9506(J)

single, etching behavior of irradiated, 11: 5931(J)

single, lattice parameter measurements, 11: 5798

structure, characteristics of junctions in, 11: 13358(R)

Germanium–hafnium alloys

structure parameters, determination by x-ray-diffraction patterns, 11: 6755(J)

Germanium iodides

iodination, 11: 2254(R)

Germanium isotopes

enrichment by (γ,n) reaction, 11: 3936(J)

neutron resonances, 11: 9448(J)

Germanium isotopes Ge^{66}

decay properties, 11: 3537(J)

Germanium isotopes Ge^{67}

decay properties, 11: 3537(J)

Germanium isotopes Ge^{69}

decay and energy levels, 11: 4989(J)

Germanium isotopes Ge^{70}

energy levels, 11: 5365(R)

Germanium isotopes Ge^{71}

electron capture in, 11: 3967(J), 6517(J)

Germanium isotopes Ge^{73}

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

energy levels, metastable state, 11: 11369(J)

Germanium isotopes Ge^{74}

neutron cross sections, 11: 11740(R)

Germanium isotopes Ge^{77}

decay schemes of Ge^{77} and Ge^{77m}, 11: 13457(J)

neutron activation cross sections, 11: 13457(J)

Germanium junctions

radiation effects, 11: 3205, 3597

Germanium–magnesium alloys

electric properties and Hall coefficients of Mg_2Ge, 11: 4453

Germanium–magnesium crystals

thermodynamic properties, 11: 8117(R)

Germanium oxides

reduction by H_2, equilibrium data, 11: 11065(J)

Germanium–silver alloys

self-diffusion in solid solutions, 11: 10564

Germanium–uranium alloys
corrosion resistance and phase studies, 11: 11716

Germanium–zirconium alloys
crystal structure, 11: 7677(R)
phase studies, 11: 11704(R)
phase studies and corrosion, 11: 8507(R)
structure of $ZrGe_2$ by x-ray diffraction analysis, 11: 7676(R)
structure parameters, determination by x-ray-diffraction patterns, 11: 6755(J)

Gibberellic acid
biosynthesis and translocation in plants, 11: 12642(R)
physiological effects, 11: 12642(R)

Glass
(See also specific glasses, e.g., Borosilicate glass; Lead glass.)
bonding to metals, 11: 10573(J), 13332
boron[11] nuclear magnetic resonance in, 11: 3596(R)
characteristics of British-made, for remote-viewing uses, 11: 11269(J)
cleaning of surfaces of, using gas discharge, 11: 8059(J)
corrosion by boiling aqua regia of steel liners, 11: 12321(R)
cryogenic data, 11: 386
fatigue and fracture tests of optical, at very low temperatures, 11: 12019
fracture patterns under different impact conditions, 11: 3784
fragmented by blast from nuclear explosion, traumatic effects, 11: 2773
gamma-absorptive, formula for, 11: 5710(P)
liquid flow rates in sintered frits, 11: 1038
neutron scattering analysis of vitreous silica, 11: 4639(J)
phase studies and crystal structure of, containing TiO_2, 11: 3804(J)
production technology in the nuclear field in Britain, 11: 11270(J)
radiation effects, 11: 7857(R), 8706(R), 12584(R)
radiation effects on optical, and light bulbs, 11: 11566(R)
radiation effects of positive ion bombardment on, 11: 7363(J)
radiation effects on power cabel insulation type, 11: 13629
radioinduced coloration, 11: 6281
scintillators for detection of intermediate energy neutrons, 11: 12151(J)
thermal capacity, 11: 4817
thermal conductivity, 11: 4817
thermoluminescence, 11: 7219(J)

Glass electrodes
anion effect on electrode potential of metals in fused salts, 11: 83(J)

Glass wool filters
acid leaching for recovery of U, 11: 2377

GLEEP
danger coefficients in, nuclear calculations, 11: 4070
design and uses, 11: 2135(J)

Glossaries
of atomic terms, 11: 5915(J)

Glove boxes
See Dry boxes.

Glow discharges
electron losses in, microwave studies, 11: 1555(J)
minimum voltage for, 11: 7233(J)
potential in diffusion and electron motion in high-frequency field, 11: 10140(J)

Glucosamine
chromatographic determination, 11: 2833(J)

Glucose
metabolism, dissimilation in free-cell neoplasm, 11: 7091(R)
metabolism in depancreatized rats, 11: 7091(R)
solutions, effects of x rays and electrons, 11: 5814(J)

Glucuronic acid
synthesis of aryl-β-D-glucopyranosiduronic acids, 11: 6637(J)

Glutathione
protective effects against radiation injuries of rabbit eyes, 11: 8797(J)
solutions, effects of atomic hydrogen on, 11: 11076(J)

Glycerol
thermal conductivity from 2 to 82°C, 11: 1855(J)

Glycerophosphates
radiolysis in aqueous solutions by 200 kv x rays, 11: 4341(J)

Glycine
metabolism in rat liver, tracer study, 11: 12642(R)
radiation effects on aqueous solutions, 11: 9916(R)
radiolysis by 30-Mev alpha particles, 11: 959

Glycogen
liver deposition in irradiated guinea pigs, 11: 12642(R)
in surviving leucocytes, effect of x-rays on, 11: 9200(J)

Gold
absorptive properties for Hg vapors, 11: 8827(J)
alpha, p, and d reactions at high energies in, absolute cross sections for production of secondary particles, 11: 4114
alpha scattering at 24.6 Mev, 11: 13473(J)
anomalous internal conversion ratios of E3 transitions, 11: 9447(J)
bremsstrahlung polarization vs. photon energy for 1-Mev electrons, 11: 1557
corrosion by ThO_2 slurries, 11: 4692(R)
corrosion by UO_2SO_4 solutions, 11: 6536(R)
corrosion in Thorex solutions, 11: 7487
deuteron elastic scattering, 11: 5365(R)
diffusion in Cu, 11: 11194(R)
diffusion in single crystals of Ag, 11: 360(J)
electrodeposition on Th, 11: 13783
excitation of characteristic K x rays from, by protons, deuterons, and α particles, 11: 12932(J)
gamma emission, 11: 2026(R), 6863
gamma reactions (γ,n), 11: 704(J)
for gasket material, sealing and corrosion properties, 11: 6344
Hall effect and resistance at low temperatures, 11: 4483(J)
multiple scattering of 0.4-Mev electrons and positrons by, 11: 5398(J)
neutron absorption by a membrane in a critical slab, 11: 9480
neutron activation determination, 11: 8285(R), 12973(R)
neutron capture cross sections, 11: 10686(R)
neutron cross sections, 11: 1273(R), 4047(J)
neutron resonance scattering and transmission measurements, 11: 10770
neutron scattering, 11: 1683(J), 3046(J), 10229
neutron total and capture cross sections, 11: 10232(R)
nitrogen nucleus reactions (N^{14}), 11: 6551(J)
photoneutron yields, 11: 4130(J)
plate, permeability, 11: 8911

Gold (cont'd)

polarographic–amperometric determination, 11: 9234(J)

proton elastic scattering, 5.7 Mev, 11: 12202(J)

proton energy loss in, 11: 4016(R)

proton inelastic scattering and (p,d) reactions, energy distributions, 11: 9495(J)

proton inelastic scattering at 6 Mev, 11: 4644(J)

proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)

proton ranges in, from 6 to 18 Mev, 11: 6142(J)

radiation effects, 11: 1922(R)

radiometric determination in sea water, 11: 11094(J)

reactions produced by electrical explosion of, immersed in fluids, 11: 9753

self-diffusion in, 11: 9043(J)

solvent extraction from aqueous solutions, effects of concentration on, 11: 6686(J)

solvent extraction in HCl–bis-2-chloroethyl system, 11: 9186(R)

solvent extraction in HCl–dibutyl phthalate–H_2O, 11: 5365(R)

spectrum of inelastically scattered neutrons from, 11: 10910

testing as pump bearings, 11: 2891

thermodynamic properties of Au and Au_2, 11: 11218

vacancy formation, energy of, 11: 11234(J)

Gold alloys

corrosion in water and NHO_3, 11: 13792

high-temperature corrosion by aqueous HF solutions, 11: 2486

Gold–cadmium alloys
See Cadmium–gold alloys.

Gold–chromium alloys
See Chromium–gold alloys.

Gold–copper alloys
See Copper–gold alloys.

Golds foils

electron scattering by, at 20 kev, 11: 440(J)

Gold ions

polymerization in aqueous solutions, 11: 6686(J)

Gold isotopes

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

Gold isotopes Au^{188}

preparation by heavy ion bombardment of Ta, 11: 9076(J)

Gold isotopes Au^{193}

decay, 11: 7313(J)

Gold isotopes Au^{195}

radiation from, studies, 11: 1253(J)

Gold isotopes Au^{196}

radiation from, studies, 11: 1253(J)

Gold isotopes Au^{197}

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

energy levels, 11: 3533(J)

neutron capture cross sections, 11: 10228

neutron capture cross sections, comparison to fission cross section of U^{235}, 11: 5493(R)

neutron reactions, (n,p), 11: 9493(J)

photofission cross sections from 150 to 500 Mev, 11: 6880(J)

photon scattering cross section, 11: 611(J)

thermal neutron capture by, soft γ rays from, 11: 10757(J)

Gold isotopes Au^{198}

backscattering correction procedure test on, 11: 1690(J)

beta spectra, calorimetric determination of energy, 11: 12940(J)

colloids, 11: 3290(J), 4784(J), 13261(J)

colloids, applications in cancer therapy, 11: 2802(J), 8810(J), 8811(J)

colloids, influence of injected, on distribution of mast cells in rat bone marrow, 11: 7062(J)

correlation coefficients and spins, 11: 10266(J)

decay schemes, 11: 776(J), 11574(R)

nuclear spin, 11: 10770

parity and electron polarization, 11: 13452(J)

Gold–silver alloys

stored energy and deformation behavior, effects of composition on, 11: 5353(J)

vacancy formation, energy of, 11: 11234(J)

Gold–silver couples

diffusion coefficients of, methods for determining, 11: 1131(R)

Gold–thorium alloys

radiation damage by protons and deuterons, fission-fragment annealing of, 11: 7693(R)

Gold–tin alloys (liquid)

electrocapillary phenomena in, investigation of, 11: 13349(J)

Gold–uranium alloys

phase studies, 11: 13824

preparation and phase studies, 11: 7694(R)

Golden Gate Canyon Area (Colo.)

wall-rock control of pitchblende deposits in, geology, mineralogy, and U distribution, 11: 1118(J)

Gonadal hormones

effects on radiosensitivity of mice, 11: 3479(R)

Gonadotropic hormones

effects on maturation of rat ovum following irradiation, 11: 4234(J)

effects on radiation injuries of gonads in mice, 11: 8772(J)

Gonads

(See also Spermatogenesis.)

radiation dosage determination in diagnostic x ray examination, 11: 11842

radiation dosage determinations for ovaries during I^{131} therapy, 11: 12147(J)

radiation dosage monitoring during radiodiagnosis, 11: 9919(J)

radiation effects of massive doses of gamma rays on rat, 11: 11866(J)

radiation effects on testes of adult Drosophila, 11: 9933(J)

radioinduced changes in female mice, effects of gonadotrophic hormone treatment, 11: 8772(J)

radiosensitivity, 11: 856(J), 2233(R), 4234(J), 5742(J), 9939(J), 12645, 12646

radiosensitivity of sperm in mouse, induction of gynogenesis, 11: 9934(J)

radiosensitivity of sperm in mouse in artificial insemination, 11: 9935(J)

sterilization of mouse, by x irradiation, evidence of chemical protection, 11: 11046(J)

Goodrich (B. F.) Co. Research Center, Brecksville, Ohio

progress reports on radiation effects on elastomeric compounds and compounding materials, 11: 7360(R)

Gould-National Batteries, Inc., St. Paul

progress reports on development of a Kapitza-type Ni–Cd battery, 11: 4401(R), 4402(R), 4403(R), 4404(R), 4405(R), 6414(R)

Graham, Crowley, and Associates, Inc., Jenkintown, Penna.

progress reports on electrodeposition of Zr, 11: 2501(R), 2502(R), 2503(R), 2504(R), 2505(R)

Grain-boundary diffusion

coefficient for metals, method of determining, 11: 1145(J)

Grain growth

origin of recrystallization nuclei, 11: 5384

Grain structure

effects of vibratory treatment on, bibliography, 11: 2921

Granites

microscopic crystals of uraninite in, 11: 286(J)

Granodiorites

distribution of α-radioactivity in, of Adamello, Italy, 11: 5866(J)

Graphite

(See also Carbon.)

absorptive properties for bismuth and Bi–Pb eutectic, 11: 7446

adsorptive properties for Ar, K, N, and NH_3, 11: 7959(J)

activation analysis for V, 11: 9996

air cooling, heat generation, thermal cycling, and properties, 11: 7719(R)

analysis, chemical and functional, 11: 13617

analysis, neutron absorption cross sections, and radiation effects, 11: 7455(R)

annealing, 11: 11739(R)

annealing, activation energies, 11: 13208

annealing, thermal and electric conductivity, and mechanical properties, 11: 8313

annealing of irradiated, mechanism, 11: 7450

annealing of radiation damages, 11: 12980

annealing of radiation damage to interlayer distance, 11: 3727

annealing of stored energy, 11: 9611(R)

annealing while in reactor to offset radiation damage, 11: 7735

annihilation radiation from oriented, angular correlation, 11: 8125(J)

anodes, effects of HF on, 11: 7494

bars of purified, production, 11: 153(R), 154(R), 155(R), 156(R), 157(R), 158(R), 159(R)

bonding, casting, and pressing of natural and synthetic, 11: 954

brazing, 11: 13805(R)

buckling in Sodium Reactor Experiment matrices, gas evolution, and distortion, 11: 13969(R)

bulk density, 11: 7123

canning by Zr, 11: 8686(R)

canning removal equipment, 11: 13503(R)

chemical properties, physical properties, and radiation effects, 11: 8266(R)

chemical reactions with Cl_2–$AlCl_3$, Br_2–$AlCl_3$, I_2–$AlCl_3$ and $FeCl_3$–$AlCl_3$, 11: 5200(J)

coefficient of friction of, on graphite, 11: 7733(R)

compression properties of grade A pile, 11: 7123

corrosion by fused fluoride melts, 11: 9581(R)

corrosion by liquid Na, magnetic susceptibility, Hall coefficient, permeation by liquid Na, and thermal shock, 11: 9725

corrosion in liquid metals, 11: 13113(R)

crystal structure, 11: 12555(R), 13564(R)

crystal structure, conical, spiral, and laminar cleavage, 11: 10599(J)

crystal structure and radiation damage, 11: 12979

crystal structure in irradiated, effects of annealing, 11: 8306

cyclotron resonance absorption in, interpretation, 11: 5803(J)

Graphite (cont'd)

density, pore size distribution, permeability toward air and liquid metals, and chemical analysis, 11: 8311

diffusion of C atoms in, 11: 7405(R), 13578(R)

dimensional stability, effects of annealing and radiation, 11: 9604

dimensional stability and crystal structure, radiation effects on, 11: 12473(R)

dimensional stability of irradiated thermally annealed, 11: 12685

effects of annealing on dimensional stability under irradiation, 11: 13884(R)

effects of radiation on hardness, 11: 10015(J)

effects of radiation on stored energy and Co spacings, 11: 7826(R)

elastic properties and electric conductivity, effects of radiation on, 11: 4163

electric and magnetic properties and radiation effects, 11: 13619

electric and thermal properties, effects of radiation on, at temperatures from 100 to 425 K, 11: 3204

electric conductivity used as radiation damage and flux monitor, 11: 9889

electrical conductivity, 11: 7405(R)

electrical conductivity, effects of temperature, structure, radiation, and bromination, 11: 1796(J)

electrical properties, effects of temperature, 11: 10014(J)

electrical resistivity, measurement of, 11: 11562(R)

electrical resistivity changes in neutron irradiated, 11: 6272(J)

electrode potential of bisulfate, 11: 7405(R)

electronic band structure, 11: 6662(J)

emissivity and reflectivity, measurement of total normal, 11: 6421

energy content, effects of irradiation and annealing, 11: 3728, 3729, 3730, 3731, 3732

energy of cohesion, compressibility, and potential energy functions, 11: 161(J)

enthalpy, 11: 8283(R)

erosion in high-velocity corrosion loops, 11: 7604

evaluation of Brookhaven National Laboratory reactor, 11: 8579

evolution of gas from moderator material and diffusion of U through, 11: 13516(J)

fabrication and mechanical properties, 11: 7599(R)

fabrication for Materials Testing Reactor reflector, 11: 640

fabrication techniques and tools, 11: 12353

fast-neutron damage to, 11: 675(J)

Hall coefficient and magnetoresistance of irradiated, 11: 9611(R)

heat transfer in porous, 11: 1032(R)

heat radiation and emissivity measurements, 11: 3797

high-density, preparation, 11: 952(R)

high-purity, preparation, 11: 952(R)

hydrofluorination in fused fluoride melts, 11: 13582(R)

impregnated with U, diffusion of total fission product activity and separated Ba, Sr, and Zr following irradiation, 11: 12982

impregnation, electrokinetic, 11: 8009

interaction with molten U at 1150 to 1400°C, 11: 9269

irradiated, interstitial compounds, 11: 9245

lattice dimensions, effects of radiation on, 11: 8543(R)

lattice vibrations and specific heat, 11: 1457

lubricity compared with MoS_2, 11: 5235(J)

Graphite (cont'd)

magnetic susceptibility, resistivity, thermoelectric power, thermal conductivity, and stored energy release of irradiated, 11: 7889(R)

magnetic susceptibility of irradiated, 11: 7405(R)

magneto-resistivity coefficient of, measurement, 11: 7888(R)

materials for production of, spectrographic analysis for B and V, 11: 8298

mechanical properties and density, 11: 10458

micropore structure of artificial, 11: 1456

neutron attenuation, 11: 2716, 4658, 11748(R)

neutron bombardment, effects on various properties, and effects of radiation from Brookhaven and Hanford reactors, 11: 7888(R)

neutron diffusion, 11: 542(J), 682(J), 4013(R), 8671, 12886

neutron diffusion and absorption by various types of, 11: 10315(J)

neutron diffusion length in sigma piles and Hanford reactors, comparison, 11: 13618

neutron induced changes in electrical resistivity, 11: 6272(J)

neutron irradiation effects on the Hall constant, 11: 8309

neutron reactions (n,γ), 11: 13209

neutron temperature measurements in, 11: 162(J), 5802(J)

neutron thermal inelastic scattering in polycrystalline, 11: 6862(J)

nickel and Al_2O_3 protective coatings for, development, 11: 11573(R)

outgassing, annealing, thermoelectric power, and stored energy of irradiated, 11: 7693(R)

oxidation, thermal and in-pile, 11: 13885(R)

oxidation and conductivity studies, 11: 7731(R)

oxidation and radiation effects on surface structure, 11: 7448

oxidation kinetics, 11: 7125(J)

oxidation of, distribution of radioactive C after, 11: 13884(R)

pebble fabrication for Materials Testing Reactor, 11: 638

physical properties, 11: 11562(R), 11656(R), 12963(R), 13113(R)

physical properties, radiation effects on, 11: 7406(R), 7456(R), 7457(R)

physical properties of reactor, 11: 9605

production, 11: 203(J)

production for nuclear reactor use, 11: 1795(R), 5832(J)

production of synthetic, 11: 12686(R)

properties, 11: 7850(R), 8547(R)

properties, structure, and uses, 11: 4322(J)

properties as a containing material, 11: 13279

properties for use as bearing material, 11: 6343

purification, 11: 13083(R)

purification, bibliography, 11: 4321

purification, compilation of data, 11: 953

purification, modification of F process, 11: 7957

purification and preparation of high density natural and synthetic, 11: 954

radiation and oxidation effects on surface structure, 11: 7448

radiation damage, 11: 675(J), 2184(J), 4162, 5233, 5569, 5668(J), 5801(J), 6271, 7691(R), 8314, 12685

radiation damage and use in atomic energy program, review, 11: 4836(J)

radiation damage in reactors, 11: 6920(J), 8186(J), 11564(R)

radiation damaged, theory for c-axis expansion and stored energy, 11: 8310

radiation effects, 11: 6920(J), 7405(R), 7449, 7710(R), 9605, 12963(R), 13578(R), 13627

Graphite (cont'd)

radiation effects, influence of temperature on, 11: 11562(R), 11566(R), 11591, 11739(R)

radiation effects and behavior as a reactor material, 11: 7449

radiation effects of neutrons on magnetic susceptibility, 11: 7124(J)

radiation effects on annealing, 11: 7888(R)

radiation effects on dimensional stability, microstructure, and thermal conductivity, 11: 13616

radiation effects on magnetic and electric properties, 11: 9603

radiation effects on magnetic properties, 11: 8305

radiation effects on oxidation, 11: 11101(J)

radiation effects on physical and electrical properties, 11: 9611(R)

radiation effects on physical properties, 11: 9579(R)

radiation effects on reactor, 11: 8307

radiation effects on temperature coefficient of expansion of, 11: 7693(R)

radiation effects on thermal expansion of pile, 11: 11592

radiation induced changes in Hall and magneto-resistivity coefficients of, pulse annealing, 11: 11820

radiocarbon from reactor, 11: 8308

reaction with steam, effect of H, CO, and radiation on, 11: 2292

reaction with uranium, 11: 13885(R)

reactions with U and oxidation of, effects of pile irradiation on, 11: 7734(R)

relaxation effects in, 11: 12981

sampling reactor, techniques and equipment, 11: 9602

sorptive properties for Bi, 11: 12214(R)

specific heat, effect of irradiation on, 11: 4323(J)

spectrographic analysis for B, 11: 13280(J)

stored energy and heat of combustion of irradiated, 11: 3733

stored energy from neutron irradiation, experimental determination, 11: 7958

stored energy of Brookhaven National Laboratory-reactor-irradiated, 11: 11590

strength properties at high temperature, 11: 1032(R)

structure and stability of the residue compounds of, 11: 7405(R)

stored energy, C^{14} in, oxidation, electrical conductance, elastic properties, and radiation effects, 11: 8264

stored energy and radiation effects, 11: 7445

support structures for Materials Testing Reactor, 11: 4078

surface properties of irradiated, 11: 5234(J)

temperature distribution and thermal stresses, 11: 13046

temperature effects on diffraction patterns, 11: 3352(J)

testing, correlation of chemical analysis and test pile results, 11: 7447

testing, heat and radiation, 11: 13883(R)

testing for purity, 11: 13617

testing procedures for Brookhaven, review, 11: 6888

thermal analysis, 11: 8688(R)

thermal conductivity, 11: 327, 1796(J), 1797(J), 2291, 2937(R)

thermal conductivity, effects of radiation, 11: 7888(R)

thermal conductivity and specific heat at low temperatures, 11: 9611(R)

thermal neutron cross section, 11: 11951(J)

thermal neutron diffusion, 11: 2633(R)

thermal properties at high temperatures, 11: 1527(R)

thermal properties of, bibliography, 11: 331

thermal stresses in fuel tubes of, in Daniels Power Pile, 11: 8683

Graphite (cont'd)

thermodynamic properties, 11: 7694(R), 7888(R)

uranium diffusion in, 11: 7904

for use in ionization chamber construction, radiation effects, 11: 2456

uses in nuclear reactors, 11: 4699(J)

vaporization coefficient and composition of the equilibrium vapor, 11: 3734(J)

vibration spectrum, 11: 10041(J)

x-ray-diffraction analysis of neutron-irradiated, 11: 2184(J)

Graphite (colloidal)

particle distribution in high dispersion, x ray studies, 11: 10013(J)

Graphite (impregnated)

with babbitt and silver, corrosion by U slurries, 11: 13742

with chlorine, production, 11: 153(R), 154(R), 155(R), 156(R), 157(R), 158(R), 159(R)

criticality studies, 11: 9841

diffusion of fission products from, 11: 8756

distribution of U in, 11: 12427

electrolytic disintegration for recovery of U, 11: 12398

fission product diffusion from, 11: 7711, 8696(R)

irradiated, Xe^{135} escape from, 11: 13620

preparation, 11: 952(R), 13700

preparation for fuel elements, 11: 13967

radiation damage, 11: 8313

radiation damage of U, 11: 8547(R)

radiation effects, 11: 8696(R)

radiation effects on fission product diffusion in, 11: 8312

radiation effects on thermal conductivity, 11: 7693(R)

thermal conductivity, 11: 8548(R)

thermal conductivity, effects of radiation damage and annealing on, 11: 14030

thermal conductivity of, effects of reactor irradiation on, 11: 12626

with uranium, fabrication, 11: 9601

uranium recovery from, using BrF_3, 11: 9637

Graphite acid sulfates

electric properties, 11: 7455(R)

pile irradiation effects on electrode potentials, 11: 11564(R)

Graphite–beryllium carbide systems
See Beryllium carbide–graphite systems.

Graphite bromides

thermal conductivity and resistivity at 10 to 300°K, 11: 9611(R)

Graphite compacts

production, 11: 153(R), 154(R), 155(R), 156, 157(R), 158(R), 159(R), 952(R), 954

Graphite compounds

friction seal, for high temperature-high speed operation, 11: 5896

preparation of $Cl_2-AlCl_3-Br_2-AlCl_3-C$, I_2-AlCl_3-C, and $FeCl_3-AlCl_3-C$, 11: 5200(J)

properties of interstitial, 11: 10014(J)

Graphite crucibles

coating of, effects on yields from remelting of U metal, 11: 7679

design for melting and casting U, 11: 9542(P)

development for U casting, 11: 13040

Graphite crucibles (cont'd)

for electrolysis of U halides in, 11: 5085(P), 5086(P)

erosion below the molten metal level, 11: 8518(R)

fabrication techniques and tools, 11: 12353

washing techniques, 11: 8462(R)

Graphite crystals

Fourier analysis, 11: 8306

structure and defects, 11: 11950(J)

Graphite moderated reactors

(See also Argonaut Reactor; BEPO; Brookhaven Reactor; Calder Hall reactors; GLEEP; Hanford Dual Purpose Reactor; Hanford production reactors; Hanford Test Reactor; Hanford Thermal Test Reactor; KAPL Thermal Test Reactor; Liquid Metal Fuel Reactor; Low Power Research Reactor; ORNL Graphite Reactor; Physical Constants Testing Reactor; Savannah River Thermal Test Reactor; Sodium Reactor Experiment.)

commercial feasibility analysis of power plant, 11: 8710

control of gas-cooled, by liquid Cd neutron absorber, 11: 7729

critical mass of, with annular enriched U loading, 11: 4013(R)

criticality studies, neutron cycle in homogeneous epithermal, 11: 12597

criticality studies for graphite-UO_2, 11: 12571

design, 11: 7030(P)

design for power production, 11: 681(J), 3562(J), 4112(J), 12596

design of homogeneous, for engineering testing, 11: 12241

energy produced in air cooled, recovery, 11: 681(J)

fuel element design for Belgian Br-I enriched U, 11: 6906

maintenance, 11: 10280

matrices, buckling measurements, 11: 13965

multiplication constants, changes with fuel burnup, 11: 4979(J)

neutron flux distribution, 11: 4658

reflectors, radiation damage to graphite in, 11: 5569

size and heat output of core in 4 designs of British reactors, 11: 3562(J)

theory and experiments, comparison, 11: 682(J)

Graphite molds

fabrication techniques and tools, 11: 12353

spray coating of, for improved casting of U, 11: 13693

for uranium casting, 11: 9746

Graphite powders

thermal conductivity measurements in air, 11: 8542

Graphite–uranium oxide systems

(See also Graphite (impregnated); Reactor fuel elements (impregnated).)

fabrication into fuel elements, 11: 13782(R)

particle size of U_3O_8 in, 11: 11562(R)

preparation and properties, 11: 13700

Graphite–uranium systems

buckling measurements and calculations, 11: 1275(R), 5493(R)

critical mass measurements on graphite-U^{235} systems, 11: 10293

criticality studies, 11: 12571, 14016

exponential experiments, 11: 682(J)

exponential experiments and temperature coefficients, 11: 13884(R)

exponential measurements and temperature effects on buckling, 11: 8116(R)

Graphite–uranium systems (cont'd)

fission product separation from, 11: 11562(R)

reactivity calculations, 11: 4071

Grass

contamination with I^{131}, 11: 4247

Gravimetric analysis

thermal, symposium on, 11: 11582

Gravitation

effects on electrochemical potentials, 11: 1767(J)

Greases

(See also Lubricants; Oils.)

analysis, laboratory manuals for, 11: 11088

high-temperature, development of thickeners for, 11: 4266(R), 11155(R)

high-temperature, physical properties, 11: 4378(R)

performance and properties, effects of radiation on, 11: 3438, 4851

performance for lubrication of high speed anti-friction bearings, properties, and testing, 11: 1184(R)

reactions of T_2 with stopcock lubricants, 11: 2270

Gt. Britain. Atomic Energy Research Establishment, Harwell, Berks, England

list of unclassified reports Jan. 1952 to Dec. 1955, 11: 9187

Great Lakes Carbon Corp., Morton Grove, Ill.

progress reports on preparation of purified graphite, 11: 153(R), 154(R), 155(R), 156(R), 157(R), 158(R), 159(R), 952(R), 1795(R)

Green Velvet Claims (Calif.)

geology, mineralogy, and distribution of U minerals, 11: 7191

Grey Eagle Mine (Mont.)

mineralogy and geology, 11: 2908(J)

Grignard reagents

chemical reactions of benzyl-type, 11: 11576(R)

Grinding

(See also Mineral dressing; Particles; Powders.)

differential, preliminary investigation, 11: 10547(J)

effects of chemical agents on, 11: 3784

study of comminution, modification of Kick's law, 11: 10548(J)

techniques for U, U alloys, Zr, and Be, 11: 8520(R)

Ground waters

determination of isotope abundance in streams, 11: 12755(J)

contamination, 11: 1026

hydraulic characteristics of, in Hanford Area, 11: 7159

inventory, storage time and mixing with ocean water, studied by tritium content, 11: 2220

localization, tracer techniques, 11: 12755(J)

radon determination in, 11: 12149(J)

sampling equipment, 11: 12725

velocity measurement of, by electric conductivity technique, 11: 1220

Guanidine

prophylactic effects against ionizing radiation of mercaptoalkyl-, 11: 11887(J)

Guided missiles

(See also Rockets.)

encyclopedia of U. S. Army, Navy, and Air Force, 11: 9904(J)

statistical analysis of reliability, 11: 1499

H

Hafnium

affinity toward non-metallic elements, 11: 84(J)

anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)

bibliography on, 11: 6736

chelation with TTA, 11: 13564(R)

cold rolling to 0.004-in. strip, mechanism of deformation texture, 11: 3867(J)

corrosion by biphenyl, 11: 5310

corrosion by high-temperature water, 11: 2903(J), 11748(R)

corrosion by high-temperature water, effects of radiation on, 11: 2482

corrosion testing specifications, 11: 1073

crystal structure, 11: 8520(R)

determination, 11: 13070(R)

dissolution by HF, H_2SO_4, HNO_3 and HCl, 11: 4470(J)

distribution in various components of N-added compounds, 11: 84(J)

effectiveness as reactor control rod material, 11: 11745(R)

fabrication, forging, melting, and rolling of, evaluation, 11: 3844

fabrication and nondestructive testing, 11: 14001

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gravimetric determination using 1-naphthylglycolic acid, 11: 1446

Hall effect measurement in, 11: 5342

ion exchange separation from Zr in F^- solutions, 11: 2353(R)

ionization potential difference and variable valence, 11: 11071(J)

melting of crystal bar, development of methods for, 11: 9751

metallography, 11: 11723

metallurgy and production, 11: 13075(R), 13768(R)

neutron cross sections, multigroup, 11: 12284

neutron total cross sections at 14 Mev, 11: 2026(R)

oxidation rates at 760 mm O_2 and 350 to 1200°C, 11: 8828(J)

physical properties, 11: 8512(R)

preferred orientation, study by Geiger-counter-spectrometer x-ray-diffraction technique, 11: 3867(J)

preparation by bomb reduction, 11: 11703(R)

production and fabrication, 11: 11726

separation from Zr, filtration of HCNS condensation products, 11: 11639

separation from Zr, recovery of spent silica gel from, 11: 8510(R)

separation from Zr by hexone–thiocyanate solvent extraction, 11: 12412

separation from Zr by solvent extraction, 11: 7673(R), 8512(R), 11642

separation from Zr by solvent extraction with di(2-ethylhexyl) phosphoric acid, 11: 10036(R)

separation from Zr by solvent extraction with TBP–ether systems, 11: 7532

solvent extraction, 11: 8283(R)

solvent extraction from $Ca(NO_3)_2$–$ZrO(NO_3)_2$–HNO_3 solutions with TBP, 11: 3747

solvent extraction separation from Zr using C_8H_5-TTA, 11: 8282(R)

solvent extraction with TTA from HCl solutions, 11: 12339(R)

solvent partition in acetylacetone, 11: 11123

sorption on Dowex-1 and elution with HCl–HF solutions, 11: 12339(R)

Hafnium (cont'd)

spectrographic determination in ZrO_2, 11: 13578(R)

Van de Graaff radiography, 11: 2772

welding equipment and procedures for use in inert atmospheres, 11: 13516(J)

welding to Zircaloy 2, 11: 13821

welding to Zr, 11: 2534, 6374

Young's modulus and Poisson's ratio, 11: 8715(R)

Hafnium alloys

metallography, 11: 11723

production report, 11: 10888(R), 10899(R), 13060(R), 13061(R), 13063(R), 13064(R), 13065(R), 13066(R), 13067(R), 13068(R), 13069(R), 13071(R), 13072(R), 13073(R), 13074(R), 13767(R)

pyrophoricity, 11: 2934(J)

reactions with N_2, 11: 4461

reactor criticality effects, 11: 13161

refining, coating, corrosion, and alloys, 11: 348(J)

separation from Zr, 11: 1826, 3366(J), 4454(R), 7677(R), 11578(R), 11701(R), 11704(R), 12378

Hafnium–aluminum alloys
See Aluminum–hafnium alloys.

Hafnium chloride complexes

molecular properties, 11: 12970(R)

Hafnium chlorides

vapor pressure, 11: 2278(R)

Hafnium compacts

fabrication, corrosion, and mechanical properties, 11: 5335

Hafnium complexes

with chloride, anion exchange, 11: 2254(R)

Hafnium fluorides

reduction in a bomb for preparation of Hf, 11: 11703(R)

Hafnium–germanium alloys
See Germanium–hafnium alloys.

Hafnium ions

hydrolytic polymerization, 11: 9587(R)

Hafnium isotopes

burnup in reactor control rods, 11: 11745(R)

energy levels of Hf^{176}, Hf^{177}, and Hf^{178}, 11: 10246

Hafnium isotopes Hf^{177}

energy levels, and the unified model, 11: 8150(J)

lifetimes, determination by method of delayed coincidences, 11: 8227(J)

neutron capture cross sections, effect of resonance parameters on, 11: 2627, 4633

Hafnium isotopes Hf^{178}

neutron capture cross sections, effect of resonance parameters on, 11: 2627, 4633

Hafnium isotopes Hf^{179}

neutron capture cross sections, 11: 11740(R)

neutron capture cross sections, effect of resonance parameters on, 11: 2627, 4633

Hafnium isotopes Hf^{180}

gamma spectra, decay scheme, 11: 6514(J)

Hafnium isotopes Hf^{181}

decay properties, 11: 8225(J)

Hafnium isotopes Hf^{183}

formation, 11: 475(J)

Hafnium oxides

thermal expansion, 11: 12794

Hafnium oxychlorides

decomposition of, for production of Hf, 11: 10899(R)

Hafnium powders

production, 11: 5335

production by the hydride process, 11: 13593

Hafnium silicides

structure parameters, determination by x-ray-diffraction patterns, 11: 6755(J)

Hafnium–thorium alloys

constitution diagrams, 11: 4454(R), 7677(R)

phase studies, 11: 8512(R)

preparation by coreduction of HfF_4 and ThF_4, 11: 11704(R)

Hair

follicles, radiosensitivity of mouse, 11: 3278

growth, radioinduced stimulation in rabbits, 11: 8778(J)

Halide complexes

stability in aqueous solutions, 11: 145(J)

with cupric, Ni^{2+}, and Zn^{2+} ions, stability, 11: 146(J)

Halides

(See also halides of specific elements and Alkaline earth halides; Alkyl halides; Aryl halides; Metal halides.)

detection of subhalides of various elements, 11: 11066(J)

determination by indirect flame photometric method, 11: 2835(J)

determination of standard molar free energy of formation of metal, 11: 6235

kinetics of dihalide ions from flash photolysis of aqueous alkali metal halide solution, 11: 11075(J)

Hall effect

measurement in Cr, Hf, Mn, Ti, V, and Zr, 11: 5342

Halocarbons

electrochemical fission of C–F bond in, 11: 5800(J)

Halogen compounds

distillation at low temperatures, 11: 9210

Halogens

determination in fluoroörganic compounds, 11: 2286

gaseous, physical properties, 11: 1581

Hamsters

radiation dosage determinations, 11: 5160(J)

radiosensitivity, 11: 21

Handbooks and manuals

for analysis of synthetic lubricants, greases, and their additives, 11: 11088

of biological data, 11: 4222

for coding CIRCLE computers, 11: 2594

for Homogeneous Reactor Experiment, 11: 8591

on instruments and control of Brookhaven Reactor, 11: 2713

of pre-operational acceptance test procedures for the Materials Testing Reactor, 11: 1658

on radiation protection, 11: 10411

on radioisotope applications, 11: 5420

on radiological health, 11: 6212

Hands

decontamination from radium salts, 11: 10414(J)

Graphite–uranium systems (cont'd)

fission product separation from, 11: 11562(R)

reactivity calculations, 11: 4071

Grass

contamination with I^{131}, 11: 4247

Gravimetric analysis

thermal, symposium on, 11: 11582

Gravitation

effects on electrochemical potentials, 11: 1767(J)

Greases

(See also Lubricants; Oils.)

analysis, laboratory manuals for, 11: 11088

high-temperature, development of thickeners for, 11: 4266(R), 11155(R)

high-temperature, physical properties, 11: 4378(R)

performance and properties, effects of radiation on, 11: 3438, 4851

performance for lubrication of high speed anti-friction bearings, properties, and testing, 11: 1184(R)

reactions of T_2 with stopcock lubricants, 11: 2270

Gt. Britain. Atomic Energy Research Establishment, Harwell, Berks, England

list of unclassified reports Jan. 1952 to Dec. 1955, 11: 9187

Great Lakes Carbon Corp., Morton Grove, Ill.

progress reports on preparation of purified graphite, 11: 153(R), 154(R), 155(R), 156(R), 157(R), 158(R), 159(R), 952(R), 1795(R)

Green Velvet Claims (Calif.)

geology, mineralogy, and distribution of U minerals, 11: 7191

Grey Eagle Mine (Mont.)

mineralogy and geology, 11: 2908(J)

Grignard reagents

chemical reactions of benzyl-type, 11: 11576(R)

Grinding

(See also Mineral dressing; Particles; Powders.)

differential, preliminary investigation, 11: 10547(J)

effects of chemical agents on, 11: 3784

study of comminution, modification of Kick's law, 11: 10548(J)

techniques for U, U alloys, Zr, and Be, 11: 8520(R)

Ground waters

determination of isotope abundance in streams, 11: 12755(J)

contamination, 11: 1026

hydraulic characteristics of, in Hanford Area, 11: 7159

inventory, storage time and mixing with ocean water, studied by tritium content, 11: 2220

localization, tracer techniques, 11: 12755(J)

radon determination in, 11: 12149(J)

sampling equipment, 11: 12725

velocity measurement of, by electric conductivity technique, 11: 1220

Guanidine

prophylactic effects against ionizing radiation of mercaptoalkyl-, 11: 11887(J)

Guided missiles

(See also Rockets.)

encyclopedia of U. S. Army, Navy, and Air Force, 11: 9904(J)

statistical analysis of reliability, 11: 1499

H

Hafnium

affinity toward non-metallic elements, 11: 84(J)

anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)

bibliography on, 11: 6736

chelation with TTA, 11: 13564(R)

cold rolling to 0.004-in. strip, mechanism of deformation texture, 11: 3867(J)

corrosion by biphenyl, 11: 5310

corrosion by high-temperature water, 11: 2903(J), 11748(R)

corrosion by high-temperature water, effects of radiation on, 11: 2482

corrosion testing specifications, 11: 1073

crystal structure, 11: 8520(R)

determination, 11: 13070(R)

dissolution by HF, H_2SO_4, HNO_3 and HCl, 11: 4470(J)

distribution in various components of N-added compounds, 11: 84(J)

effectiveness as reactor control rod material, 11: 11745(R)

fabrication, forging, melting, and rolling of, evaluation, 11: 3844

fabrication and nondestructive testing, 11: 14001

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gravimetric determination using 1-naphthylglycolic acid, 11: 1446

Hall effect measurement in, 11: 5342

ion exchange separation from Zr in F^- solutions, 11: 2353(R)

ionization potential difference and variable valence, 11: 11071(J)

melting of crystal bar, development of methods for, 11: 9751

metallography, 11: 11723

metallurgy and production, 11: 13075(R), 13768(R)

neutron cross sections, multigroup, 11: 12284

neutron total cross sections at 14 Mev, 11: 2026(R)

oxidation rates at 760 mm O_2 and 350 to 1200°C, 11: 8828(J)

physical properties, 11: 8512(R)

preferred orientation, study by Geiger-counter-spectrometer x-ray-diffraction technique, 11: 3867(J)

preparation by bomb reduction, 11: 11703(R)

production and fabrication, 11: 11726

separation from Zr, filtration of HCNS condensation products, 11: 11639

separation from Zr, recovery of spent silica gel from, 11: 8510(R)

separation from Zr by hexone–thiocyanate solvent extraction, 11: 12412

separation from Zr by solvent extraction, 11: 7673(R), 8512(R), 11642

separation from Zr by solvent extraction with di(2-ethylhexyl) phosphoric acid, 11: 10036(R)

separation from Zr by solvent extraction with TBP–ether systems, 11: 7532

solvent extraction, 11: 8283(R)

solvent extraction from $Ca(NO_3)_2$–$ZrO(NO_3)_2$–HNO_3 solutions with TBP, 11: 3747

solvent extraction separation from Zr using C_6H_6-TTA, 11: 8282(R)

solvent extraction with TTA from HCl solutions, 11: 12339(R)

solvent partition in acetylacetone, 11: 11123

sorption on Dowex-1 and elution with HCl–HF solutions, 11: 12339(R)

Hafnium (cont'd)

spectrographic determination in ZrO_2, 11: 13578(R)

Van de Graaff radiography, 11: 2772

welding equipment and procedures for use in inert atmospheres, 11: 13516(J)

welding to Zircaloy 2, 11: 13821

welding to Zr, 11: 2534, 6374

Young's modulus and Poisson's ratio, 11: 8715(R)

Hafnium alloys

metallography, 11: 11723

production report, 11: 10888(R), 10899(R), 13060(R), 13061(R), 13063(R), 13064(R), 13065(R), 13066(R), 13067(R), 13068(R), 13069(R), 13071(R), 13072(R), 13073(R), 13074(R), 13767(R)

pyrophoricity, 11: 2934(J)

reactions with N_2, 11: 4461

reactor criticality effects, 11: 13161

refining, coating, corrosion, and alloys, 11: 348(J)

separation from Zr, 11: 1826, 3366(J), 4454(R), 7677(R), 11578(R), 11701(R), 11704(R), 12378

Hafnium–aluminum alloys
See Aluminum–hafnium alloys.

Hafnium chloride complexes

molecular properties, 11: 12970(R)

Hafnium chlorides

vapor pressure, 11: 2278(R)

Hafnium compacts

fabrication, corrosion, and mechanical properties, 11: 5335

Hafnium complexes

with chloride, anion exchange, 11: 2254(R)

Hafnium fluorides

reduction in a bomb for preparation of Hf, 11: 11703(R)

Hafnium–germanium alloys
See Germanium–hafnium alloys.

Hafnium ions

hydrolytic polymerization, 11: 9587(R)

Hafnium isotopes

burnup in reactor control rods, 11: 11745(R)

energy levels of Hf^{176}, Hf^{177}, and Hf^{178}, 11: 10246

Hafnium isotopes Hf^{177}

energy levels, and the unified model, 11: 8150(J)

lifetimes, determination by method of delayed coincidences, 11: 8227(J)

neutron capture cross sections, effect of resonance parameters on, 11: 2627, 4633

Hafnium isotopes Hf^{178}

neutron capture cross sections, effect of resonance parameters on, 11: 2627, 4633

Hafnium isotopes Hf^{179}

neutron capture cross sections, 11: 11740(R)

neutron capture cross sections, effect of resonance parameters on, 11: 2627, 4633

Hafnium isotopes Hf^{180}

gamma spectra, decay scheme, 11: 6514(J)

Hafnium isotopes Hf^{181}

decay properties, 11: 8225(J)

Hafnium isotopes Hf^{183}

formation, 11: 475(J)

Hafnium oxides

thermal expansion, 11: 12794

Hafnium oxychlorides

decomposition of, for production of Hf, 11: 10899(R)

Hafnium powders

production, 11: 5335

production by the hydride process, 11: 13593

Hafnium silicides

structure parameters, determination by x-ray-diffraction patterns, 11: 6755(J)

Hafnium–thorium alloys

constitution diagrams, 11: 4454(R), 7677(R)

phase studies, 11: 8512(R)

preparation by coreduction of HfF_4 and ThF_4, 11: 11704(R)

Hair

follicles, radiosensitivity of mouse, 11: 3278

growth, radioinduced stimulation in rabbits, 11: 8778(J)

Halide complexes

stability in aqueous solutions, 11: 145(J)

with cupric, Ni^{2+}, and Zn^{2+} ions, stability, 11: 146(J)

Halides

(See also halides of specific elements and Alkaline earth halides; Alkyl halides; Aryl halides; Metal halides.)

detection of subhalides of various elements, 11: 11066(J)

determination by indirect flame photometric method, 11: 2835(J)

determination of standard molar free energy of formation of metal, 11: 6235

kinetics of dihalide ions from flash photolysis of aqueous alkali metal halide solution, 11: 11075(J)

Hall effect

measurement in Cr, Hf, Mn, Ti, V, and Zr, 11: 5342

Halocarbons

electrochemical fission of C–F bond in, 11: 5800(J)

Halogen compounds

distillation at low temperatures, 11: 9210

Halogens

determination in fluoroörganic compounds, 11: 2286

gaseous, physical properties, 11: 1581

Hamsters

radiation dosage determinations, 11: 5160(J)

radiosensitivity, 11: 21

Handbooks and manuals

for analysis of synthetic lubricants, greases, and their additives, 11: 11088

of biological data, 11: 4222

for coding CIRCLE computers, 11: 2594

for Homogeneous Reactor Experiment, 11: 8591

on instruments and control of Brookhaven Reactor, 11: 2713

of pre-operational acceptance test procedures for the Materials Testing Reactor, 11: 1658

on radiation protection, 11: 10411

on radioisotope applications, 11: 5420

on radiological health, 11: 6212

Hands

decontamination from radium salts, 11: 10414(J)

Hanford Area (Wash.)
geology, influence on hydraulic characteristics of ground waters, 11: 7159

Hanford Dual Purpose Reactor
fuel irradiation time, effects on power production costs, 11: 11780
operating temperature for most efficient power generation, 11: 7823
reactivity temperature coefficient, effect of long exposures, 11: 12552

Hanford Production Reactors
activity of discharge water, 11: 9836
biological shielding materials, 11: 2764
control rod calibration, 11: 7821
coolant flow in ribbed annuli, 11: 7740
coolant pH adjustment facility, 11: 2685
coolant water monitoring, 11: 13852
corrosion of Al under conditions simulating, 11: 7605
fuel element cladding, with a Schloemann cable-cladding press, 11: 12230
fuel element processing, 11: 8423
high-density concrete for shielding, 11: 3213
lattice parameters, 11: 8573
neutrino emission of, and possible health hazards from, 11: 12518
neutron diffusion length in graphite, 11: 13618
process specifications in cooling water treatment, 11: 13920
process tubes, slug chattering in, 11: 8666
process tubes for, using organic coolants, 11: 8170
power recovery using water expansion, 11: 3788
reactivity, 11: 13965
reactivity and buckling, 11: 13965
rear face monitoring, television system for, 11: 11732
resistance thermometers for, corrosion, 11: 3909
resonance escape probability measurements, 11: 11348
resonance escape probability by natural U, 11: 2681
slug element fabrication from depleted U, 11: 8500
tube corrosion, metallographic examination, 11: 8668
tubes, fabrication of Zr process, 11: 13764

Hanford Production Reactors (K)
biological shield, construction techniques and equipment, 11: 2765
cooling system, evaluation of stainless steel connectors for, 11: 2684

Hanford Test Reactor
description, operating procedures, and calibration, 11: 2115
multiplication factor and reactivity, 11: 1616

Hanford Thermal Test Reactor
operating characteristics, 11: 5493(R)

Hanford waste slurries
containers for, electrical analogue for studying thermal stresses, 11: 6698
physical and chemical properties, 11: 7596
recovery of Np from Pu, 11: 7467
settling rates and properties, 11: 13590
storage tanks, possible materials for, 11: 9724
viscosity and settling rates for, 11: 7592

Hanford Works, Richland, Wash.
environs monitoring, 11: 2240, 8260
progress reports on chemical research, 11: 8368(R)

Hanford Works, Richland, Wash. (cont'd)
progress reports on radiological science, 11: 8261(R)
progress reports on Redox equipment testing, 11: 8366(R)
stack disposal, diffusion calculations, 11: 2471
progress reports on waste loss reduction, 11: 11622(R)

Happy Jack Claims (Wyo.)
geology, 11: 12734

Hardness
measuring techniques for coatings at high temperatures, 11: 4545
size effect on micro-indentation testing, 11: 6342
testing equipment for Magnox C alloy, 11: 8918

Harmonic analysis
of crystals, applied in determinations of isotope effects on thermodynamic functions of hindered rotators, 11: 10008(J)
Herglotz theorem, new relations following from, 11: 12136(J)
Hill and Mathieu equations, solutions, 11: 12134
of particulate motion, 11: 2971
of wave with periodic frequency modulation, 11: 2587

Harshaw Chemical Co., Cleveland
progress reports, 11: 9645(R), 9646(R), 9674(R)

Harvard Univ., Boston. Air Cleaning Lab.
progress reports, 11: 3886(R)

Hawthorn Formation (Fla.)
geology and exploration, 11: 2909(J)

Head
radiation effects, 11: 858(J)

Health physics
in atomic energy, programs of AEC, 11: 4220(J)
basic information on, 11: 8801(J)
bibliography on health and safety, 11: 2226
data and definitions used in radiation dosimetry, survey, 11: 48
financial protection against atomic hazards, 11: 3647(J)
handbook, 11: 6212
hazards due to emission of neutrinos from Hanford reactors, 11: 12518
manual, 11: 10411
maximum permissible concentrations of long-lived radioisotopes, revisions in computing, 11: 2234
maximum permissible internal dose of radionuclides, 11: 3306(J)
papers from conference on, 11: 3310(J)
problems with internal radioactivity, 11: 11044(J)
procedures for U^{235} in exponential studies, 11: 12962
radiation control at Savannah River Laboratory, 11: 4326
reactor siting problems and hazards to public, 11: 3548
survey, 11: 9959(J)
training program outline and bibliography, 11: 7921
training programs, 11: 14(J)
uranium tolerance, 11: 12313

Health physics conferences
on air cleaning problems, 11: 2473
proceedings of, held at Ann Arbor, Mich., 1956, 11: 10416(J)

Heart
biological effect of x radiation on isolated frog, 11: 1737(J)
effects of whole-body x irradiation in rats, 11: 5142(J)

Heart (cont'd)
function, tracer studies, 11: 17(J)
function tests following production of radioinduced defects, 11: 5132(R)
radiation effects on potassium content in rabbit, 11: 3667(J)
radioinduced injuries in rats, 11: 3666(J)
Heart diseases
thyroidal and renal clearance of I^{131} in patients with, 11: 6627(J)
Heat
gamma absorption, 11: 13209
Heat exchangers
(See also Heat transfer.)
analysis of contents of cold trap after NaK run, 11: 12355
barrier materials for Na–H_2O systems, evaluation, 11: 2438
blast shield for Homogeneous Reactor Test, 11: 8626
cleaning of Homogeneous Reactor Test, 11: 8641
corrosion by $CuSO_4$–H_2SO_4–UO_2SO_4, 11: 9287
corrosion by liquid Na, 11: 9285
design, testing, and tube design, 11: 10056
design and performance, effect of ThO_2 slurries on, 11: 10513
design and performance of screen matrices at high Reynolds numbers, 11: 230
design and use with Canadian reactors, 11: 13(J)
design considerations for homogeneous reactor, 11: 12527
design considerations for submarine, 11: 7833
design for better leak detection, 11: 3255(P)
design for gas-cooled reactors, 11: 1912(J)
design for homogeneous research reactor, 11: 9793
design for Homogeneous Reactor Test, 11: 7857(R)
design of NaK–Na, 11: 7727
design of shell and tube type, 11: 1042
design of steam, in Shippingport Pressurized Water Reactor, 11: 13189(R)
fabrication of NaK-to-H_2O, 11: 13763(R)
fluid friction data for square array tubular, method of correlating, 11: 9703
heat loss and insulation performance of Homogeneous Reactor Test, 11: 8637
heat transfer and fluid friction in a shell-and-tube, 11: 6707(J)
heat transfer correlations for air-cooled finned tubes, 11: 6329
heat transfer review, 11: 5300(J)
intermediate circuit for liquid metal-fuelled reactor, 11: 5123(P)
leak detection in double-walled, 11: 6320
leak tests on Homogeneous Reactor Test, 11: 8636
liquid level measurements in Homogeneous Reactor Test, placement of taps for, 11: 8166
mathematical analysis, 11: 8894
materials for, proposed program for corrosion testing, 11: 12730(R)
performance in Fluoride Volatility Process, 11: 11968
performance of Homogeneous Reactor Experiment, 11: 9863(R)
performance of Sodium Reactor Experiment main airblast, 11: 4095(R)
plugging in homogeneous reactor slurry blanket mockup, 11: 2888
pressure drop and velocity of coolant of, analysis, 11: 1042
pressure drop calibration of Homogeneous Reactor Test fuel, 11: 10932
Heat exchangers (cont'd)
radiolysis of water in Homogeneous Reactor Test, generation of O_2 from, 11: 8608
rupture of Homogeneous Reactor Test, pressure rise in shield due to, 11: 6526
sample line cooler for Homogeneous Reactor Test, design, 11: 2654
steam-water ratios in, gamma-absorption techniques for measuring, 11: 6783
stress corrosion in Homogeneous Reactor Test mockup, 11: 9288
stresses in tube sheet and tube sheet rings of Experimental Breeder Reactor, 11: 9833
structural failure in Liquid Metal Heat Transfer Test Facility, 11: 3791
temperature distribution in a double annulus, counter-flow, 11: 6706
temperature distribution in liquid metal double-annulus, 11: 2887
test data on Homogeneous Reactor Test, 11: 7861(R)
test results on a heat-cooler unit for the ORNL Research Reactor in-pile loop, 11: 10725
thermal characteristics of a delta array, 11: 4848
tube spacers, pressure drop of, 11: 10056
use of ceramic blocks with parallel passages for construction, 11: 6586(P)
welding techniques for, 11: 5873
Heat exchangers (liquid-liquid)
design for Homogeneous Reactor Test, 11: 6092
Heat of combustion
measurement with precision combustion calorimeter, 11: 3468
Heat of formation
in binary inorganic systems, 11: 1173(J)
estimate for Ti, Zr, Nb, Ta, and Cr diborides, 11: 1915(J), 8909(J)
methods of measurement, 11: 11563(R)
Heat-resisting alloys
brazing, high-temperature vacuum and hydrogen furnace, 11: 5338
brazing using Ni–Cr–B system, 11: 10581(J)
creep, fatigue, and rupture in temperature range to 1650°F, 11: 3852
damping capacity, elastic properties, and fatigue at room and elevated temperature, 11: 5345(R)
development, 11: 324, 5890
effect of crucible materials on high-temperature properties of vacuum-melted, 11: 11204
fracture and disc-bursting characteristics, 11: 8925
hardness, heat treatment, and thermal and mechanical properties, 11: 8011
high-temperature properties at 1200 to 1700°F and above, panel on, 11: 4881
impact behavior of, 11: 10557
industrial uses, mechanical and thermal properties, welding, 11: 5336, 5337
phase diagrams of Cr–Fe–Mo–Ni, 11: 3869(J)
phase studies, temperature, heat resistance, and composition relation of Al–Cr–Ni–W–Ti, 11: 3432(J)
phase studies of Ni–Cr–W–Ti–Al quinary system, 11: 1895(J)
powder metallurgy, effect of additives on creep and slip, 11: 301
properties, development and improvement of Co alloy, 11: 1139(R)
properties of Al–Fe–Mo, 11: 1907(J)
properties of Al–Ti, 11: 1165(J)
properties of Mo–Nb and Mo–Ti, 11: 5348(R)
properties of Ni–Cr–Ti–Al, 11: 1166(J)
quality control, stress-rupture properties, 11: 3435(J)

Heat-resisting alloys (cont'd)

spectrophotometric analysis for boron by quinalizarin method, 11: 8848(J)

strength, effect of particulate substances on, at elevated temperatures, 11: 2912

testing of Al–Cr–Fe–Ti, 11: 372(J)

welding, metallurgy of, 11: 10580(J)

Heat transfer

(See also Boiling; Condensation; Convection; Heat exchangers; Thermal conductivity; Thermal radiation; Sublimation.)

analog computer for problems in convective, 11: 9388

analogue for thermal analysis of fuel elements, 11: 10923(R)

analysis of, in thermonuclear powered rockets, 11: 8895(J)

analysis of boiling and liquid metal, 11: 5832(J)

analysis of rates for tubes of various materials, 11: 11161

between components of gas turbine engines, 11: 10514(J)

bibliography on, 11: 4849

boiling, bibliographies, 11: 4412(R)

boiling, bubble dynamics in, conference on, 11: 7163

boiling, in burnout and to binary mixtures, 11: 5835(R)

boiling, vapor formation and behavior, 11: 6325

boiling and non-boiling coefficients for, in rectangular channels at 2000 psia, 11: 240

boiling burnout analysis, 11: 6705(R)

boiling due to sudden large power surge, 11: 11426

boiling studies for Experimental Boiling Water Reactor, 11: 11747(R)

bubble formation at high power densities, 11: 9706

burnout, 11: 5834, 6333, 11167

burnout at temperatures 400 to 600°F of Ni tubes, 11: 10063

burnout correlation, subcooled, 11: 13720

burnout data for inclined Zircaloy-2 channel, 11: 12445

burnout for water flow in long rectangular channels, 11: 11166

burnout heat flux in rectangular channels of Zircaloy-2, 11: 5299

burnout limits for biphenyl, 11: 6324

burnout of Zircaloy channels, effect of length-to-diameter ratio on, 11: 10865

burnout studies in Materials Testing Reactor, 11: 12968

burnout studies with water and polyphenyls, 11: 12012(R)

burnout testing, 11: 11745(R)

burnout tests for water at 2,000 psia, zero net flow in long rectangular channel, 11: 10062

burnout tests on vertical rectangular zircaloy tubes, 11: 12444

calculation in evaporators, 11: 13712

calculation in fluidized beds using nomographs, 11: 8897(J)

calculation of core dimension of crossflow heat exchanger, 11: 8894

coefficients, 11: 1042, 1122, 3382, 6326

convective flow in heat generating fluid, 11: 236

correlations of, for air flowing across banks of finned tubes, 11: 6329

cross flow of water through tube banks at high Reynolds numbers, 11: 1503

of crossflowing Hg in a staggered tube bank, 11: 6709(J)

in cylindrical rod, water cooled matrices, 11: 13048

from cylindrical rods during cross-sectional flow of two-phase stream, 11: 251(J)

devices for reactors, 11: 4774(P)

Heat transfer (cont'd)

to earth from an asphalt-lined radioactive waste disposal pit, 11: 5851(J)

effect of corrosion films on, in Al, 11: 11684

effect of sudden large power surges, 11: 1848

electric analogue for study of, 11: 13868(R)

equations for components of Materials Testing Accelerator targets, 11: 8438

evaluation of, in reactor components, 11: 12242

experimental studies, 11: 11160

in finite plate with environment having temperature as prescribed function of time, 11: 6327

in flow between parallel plates with variable heat sources, 11: 13313(J)

from fluid containing a distributed heat source, 11: 13309

for fluid flow in circular conduits, annuli and between, 11: 1045(J)

and fluid flow in ducts, 11: 9276

for forced convection bulk boiling, 11: 5297

free convection, to a horizontal cylinder from an ordinary fluid containing a volume heat source, 11: 11159

free convection flow studies, 11: 13714

for fuel element configurations, 11: 10515

in Hanford waste tanks, electrical analogue for studying, 11: 6698

in Homogeneous Reactor Test pressure vessel, 11: 2105

in-pile burnout tests, 11: 12606

in liquid-gas flow, 11: 12015(J)

in liquid metal systems, 11: 683(J), 2887, 5357(J)

for liquids and gases in boiler and heat exchangers, 11: 6707(J)

mathematical analysis of, lumped metal heat capacity in, 11: 13718

mathematical analysis of surface temperatures for nuclear systems and uncertainties, 11: 11412

measurement, 11: 4412(R), 4686, 6703(R), 10060

in miniaturized electronic equipment, 11: 1034

natural convection, from inclined flat plate, interferometric studies, 11: 11164

naturally circulating, high boiling point, organic matter, 11: 6334(J)

in non-Newtonian fluids, characteristics of, 11: 9704

to non-Newtonian fluids for laminar flow through tubes, 11: 6335(J)

in nuclear power plant engineering, 11: 13516(J)

in nuclear reactors, 11: 8588

nucleate boiling effects, 11: 11795

in oils and shot-oil mixture, 11: 10862

one-dimensional heat induction equation, 11: 11162

by organic compounds, 11: 5298

in oscillating air flow, 11: 239

with polyphenyls, 11: 5836(R)

in porous graphite, 11: 1032(R)

to porous tubes from fluid stream, 11: 6328

problems with temperature dependent thermal conductivity, 11: 3787

progress for reactors, abstracts of papers on, 11: 1849

properties of diphenyl as working fluid in heat engines, 11: 5844(J)

properties of wire cloth, 11: 11163

in reactor cooling systems, 11: 13047

in reactors, 11: 8581

Heat transfer (cont'd)

research program at Westinghouse, 11: 3794

review, 11: 5300(J)

in semi-infinite carbon steel slabs, 11: 10863

simulation of hot channel boiling in water cooled reactors, 11: 11814

of slurries, methods of computing, 11: 237

to small cylinders in subsonic high-temperature gas stream, 11: 12722

in static granular beds, bibliography on, 11: 10058

in steam generators, 11: 9278

studies for Organic Moderated Reactor Experiment, 11: 6087(R)

subcooled boiling burnout in vertical Zircaloy-2 channel, 11: 7597

surface friction and, in finned annuli, 11: 5912

survey of, in Atomic Energy Commission project, 11: 11669

testing equipment installation, 11: 6704(R)

tests of fuel element mockups, pitting anodic corrosion, 11: 3815

theory, 11: 230, 2707

theory of thermal waves, flat-surface problems, 11: 12013(J)

thermal characteristics of a delta array heat exchanger, 11: 4848

in thermal heterogeneous reactors, 11: 13719

through insulation supports in low temperature equipment, 11: 3384(J)

time and space temperature distribution in a sphere with a constant heat source, 11: 12011

with turbulent gas flow in plane annular passages, 11: 5837(R)

in water under transient conditions, 11: 7166

wetting of refractory metal surfaces by liquid metals for, 11: 3247(P)

Heat transfer systems

design, for measurements of heat transfer, 11: 4412(R)

Heaters

(See also Furnaces; Induction heating.)

calrod insertion forces, 11: 12557

design for internally heating slug elements, 11: 8447

electric, radiation effects, 11: 13724

for pressurizer of Homogeneous Reactor Test, testing, 11: 3064

superheater for homogeneous reactor, mathematical analysis of design, 11: 13892

Heavy water reactors

(See also specific heavy water reactors, e.g., Argonne Research Reactor; Homogeneous Reactor Test.)

buckling measurements of D_2O lattices in, effect of photoneutrons on, 11: 12508(R)

critical dimensions of pipes carrying solutions for, 11: 6520

critical size experiments for, facilities, 11: 8684

design and cost studies of, for engineering testing, 11: 12212

design and evaluation, 11: 7716

design and neutron flux measurements, 11: 13965

design characteristics and dimensions of 10-Mw natural U, 11: 6077

design concepts, 11: 11407(R)

design for engineering testing, 11: 13490

design for power production, 11: 13(J)

design of helium cooled, 11: 6075

design of light-water cooled heavy-water moderated Pu production, 11: 3261(P)

Heavy water reactors (cont'd)

design of Massachusetts Institute of Technology research, 11: 3572(J)

design of pressurized, for power production, 11: 13185

design of Russian research, 11: 591(J)

design of Th breeder heterogeneous, 11: 13960

design study of Mighty Mouse, 11: 10717

economic study, 11: 13916

flux peaking in homogeneous, 11: 11402

fuel costs for enriched homogeneous, 11: 1668(J)

fuel rod assembly design, 11: 8252(P)

fuelling system for natural uranium reactor with long rods for high burn-up without recycling, 11: 6894

heat generation and γ flux in D_2O-moderated Experimental Boiling Water Reactor, 11: 11747(R)

homogeneous, for power plant, 11: 8183(J)

industrial power from, 11: 681(J)

matrices, 11: 7842(R)

matrices, experiments and measurements, 11: 1326

maximum utilization of D_2O in, 11: 13887

neutron calculations for French, 11: 682(J)

neutron calculations for Italian, 11: 682(J)

neutron temperature measurements in a natural U–D_2O lattice, 11: 13172

p- and f-factors in Al clad heavy-water-cooled fuel element in, 11: 6903

power generation by, in Canada, 11: 5578

reactivity and neutron lifetimes, 11: 4103(J)

safety and control rod reactivity equivalents, measurements, 11: 4103(J)

sodium-cooled, deuterium-moderated, status of development, 11: 2775(J)

specifications and uses of proposed Swiss, 11: 1662(J)

Helium

alpha particle scattering, 11: 751(J), 752(J)

analysis for H_2, 11: 7429(R), 13969(R)

compressibility of solid, and phase transition, 11: 2960(J)

configuration interaction for ground state, 11: 538

corrosive effects on U, 11: 2484, 7655(R)

cryogenic data, 11: 386

crystal structure of solid, 11: 9054(R)

electron loss from fast hydrogen atoms passing through, 11: 7354(J)

electron yield for, incident on Au surface, 11: 11295(J)

excitation cross sections near threshold, 11: 3008, 10257(J)

excitation of fast atoms of, by H and Ne atoms, 11: 5064(J)

ground state of atom, 11: 5916(J)

impulse discharge characteristics, 11: 6481(J)

interactions with H atoms, potential energy, 11: 740(J)

ionization yields for fission fragments, 11: 8117(R)

isotope abundance ratios, determination, 11: 8001(J)

large angle collisions with He, A, and Ne, measurement, 11: 12763(J)

light emission from α-particle stopping in, 11: 1274(R)

melting of solid, 11: 4496(J)

meson(K^-) absorption by, 11: 12833(J)

meson (μ) energy loss in, 11: 6493

neutron elastic scattering, polarization, 11: 8149(J)

Helium (cont'd)

properties as a reactor coolant, 11: 5839

proton scattering, 181 Mev, 11: 12205(J)

proton scattering at 7.5 Mev, differential cross section for, 11: 3032(J)

purification, 11: 7847(R)

scattering in He, Ne, A, and Kr, total cross sections for, 11: 11295(J)

scattering of H atoms in, 11: 741(J), 9501(J)

solubility in liquid Na, 11: 1957

sparking potential at low pressures, 11: 7231(J)

thermodynamic properties, 11: 13374

thorianite fragmentation on heating caused by, 11: 8914(J)

Helium (liquid)

behavior, theoretical analysis, 11: 1217(J)

cold neutron inelastic scattering theory, 11: 10701(J)

cryogenic data, 11: 386

lattice model, 11: 13420(J)

measurement of product of viscosity and density of, with a torsional crystal, 11: 12761(J)

neutron diffraction patterns, interpretation, 11: 1278(R)

positron annihilation in, 11: 6023(J), 6024(J)

storage vessels, design, 11: 7980(J)

temperature scale, 11: 4496(J)

vapor pressure-temperature scale from 1 to 4.2°K, 11: 2559

viscosity relation to temperature, kinetic phenomena, 11: 1927(J)

Helium films

nonisothermal flow of He II, 11: 13418(J)

Helium ion beams (He^3)

hyperfine structure, 11: 1383(R)

inelastic scattering in Materials Testing Accelerator target materials, 11: 9887(R)

production of doubly ionized, 11: 9054(R)

Helium ions

(See also Alpha particles.)

charge exchange and scattering in Ne and He, 11: 445

correlation effects in the ground state, 11: 1707(J)

electron capture and ionization in collision of singly charged, with atoms of rare gases, 11: 3200(J)

electron losses for fast, passing through atomic H, 11: 5063(J)

gas ionization by positive, with formation of multi-charged ions by single collision, 11: 3201(J)

Helium isotopes

abundance ratios, 11: 5374(J)

determination of λ temperatures, 11: 4189(J)

Helium isotopes (liquid)

lambda temperatures of He^3–He^4 mixtures, 11: 13576(R)

Helium isotopes He^3

binding energy, effect of hard core on, 11: 13475(J)

binding energy calculations, 11: 5556(J)

cross section and angular distributions of, from D-D reactions between 40 and 90 kev, 11: 707(J)

deuteron reactions (d,n), 11: 9886(R)

deuteron reactions (d,p), cross sections, 11: 2148(J)

deuteron stripping, 11: 9773

Helium isotopes He^3 (cont'd)

enrichment from atmospheric He, operation of thermal diffusion plant for, 11: 10469

flow properties at temperatures below the lambda point of He^3–He^4 mixtures, 11: 7221(J)

fluid density in He^4, effective normal, 11: 13421(J)

formation from deuteron reactions in hydrogen, μ meson catalysis of, 11: 13523(J)

gas recovery system, 11: 8725

isotopic shift in, spectrum, 11: 1384(J)

measurement in meteorites by neutron activation, relation to cosmic radiation, 11: 8000(J)

melting curves, 11: 4500(J)

melting from 0.16 to 1.51°K, 11: 8265(R)

nuclear magnetic moment of, sign, 11: 8158(J)

photodisintegration, sum rules for, 11: 10261(J)

properties at low temperatures, 11: 11305(J)

purification and handling, procedures and equipment for, 11: 11293

solidification, equipment for, 11: 9578(R)

specific heat and susceptibility, theory of, 11: 13423(J)

spectra, hyperfine structure of metastable state of singly ionized, 11: 12177(R)

stripping, 11: 10996(R)

stripping, production of 320-Mev deuterons by, 11: 8725

stripping for deuteron production in Materials Testing Accelerator, 11: 9887(R)

stripping of, energy spectrum of deuterons from, 11: 8567

thermodynamic quantities of He^3–He^4 mixtures, 11: 4905(J)

Helium isotopes He^3 (liquid)

osmotic pressure of He^3–He^4 mixtures at temperatures below λ point, 11: 4904(J)

specific heat and entropy, 11: 2940(J)

surface tension, 11: 13422(J)

theory of, and mixtures with He^4, review, 11: 11262(J)

thermal conductivity and viscosity, 11: 13424(J)

vapor pressures below 1°K, 11: 6759(J)

viscosity by oscillating disk method, 11: 8977(J)

Helium isotopes He^4

density from 1.2 to 4.4°K, 11: 5913(J)

deuteron reactions (d,p), 11: 3008, 4711(J)

flow properties at temperatures below the lambda point, 11: 7221(J)

fluid density of He^3 in, effective normal, 11: 13421(J)

isotopic shift in, spectrum, 11: 1384(J)

mass measurement in mass spectrograph, 11: 619(J)

melting curves, 11: 4500(J)

neutron scattering by, 11: 6038(J), 6490

nonmesonic decay of hyperfragment, 11: 4620(J)

photodisintegration, theory, 11: 6938(J)

proton elastic scattering at 40 Mev, cross section, 11: 6876(J)

proton scattering by, optical model analysis, 11: 10773(J)

thermodynamic quantities of He^3–He^4 mixtures, 11: 4905(J)

viscosity at low temperatures, 11: 5407(J)

Helium isotopes He^4 (liquid)

density and viscosity of normal, from 1.2°K to λ point, 11: 6339(J)

Helium isotopes He^4 (liquid) (cont'd)

energy spectrum, mathematical analysis, 11: 12950(J)

osmotic pressure of He^3–He^4 mixtures at temperatures below λ point, 11: 4904(J)

phase transformation, theory of, 11: 13414(J)

specific heat below 0.7°K, 11: 11271(J)

theory of mixtures with He^3, review, 11: 11262(J)

viscosity by oscillating disk method, 11: 8977(J)

Helium isotopes He^5

formation by Li^7 (d,α) reaction, 11: 693(J)

neutron-alpha angular correlation in deuteron reactions Li^7(d,α) and the ground state of, 11: 9492(J)

Helium isotopes He^6

beta decay, 11: 551

beta spectra, 11: 7292(R)

Helium–water systems

thermodynamic properties of saturation and superheated mixtures, 11: 1212

Hematopoietic system

radioinduced essential reticulosis following chronic exposure, 11: 8770(J)

radiosensitivity, 11: 1739(J), 3277(J), 4791(J), 5153(J), 12642(R), 13565(R)

radiosensitivity, effects of injected bone marrow tissue, 11: 8776(J), 8798(J), 9952(J)

radiosensitivity in chicks, 11: 7910(R)

radiosensitivity in newborn rats demonstrated by reticulocyte crisis, 11: 7061(J)

radiosensitivity in tadpoles, modifications produced by cysteine treatment, 11: 12959(R)

radiosensitivity in white mice, protective effects of carbon monoxide, 11: 10401(J)

regeneration, effects of sinus wall, 11: 11844(J)

stimulation of, in therapy of acute radiation sickness, 11: 9969(J)

tissue transplantation, 11: 885(J)

tumors, application of Bi isotopes in therapy, 11: 891(J)

Heme

synthesis, effects of x radiation in ducks, 11: 12960(R)

Hemoglobin

influence on anoxia tolerance, 11: 9193(J)

metabolism, effects of burns in swine, 11: 11017

radiation effects, 11: 13565(R)

Hemolysins

formation, radiosensitivity, 11: 4238(J), 4792(J)

Hemolysis

protective effects of albumen solutions of casein, parathyrin, and saccharose, and colloidal-salt solution injections in irradiated rabbits, 11: 7073(J)

Hemorrhage

radiosensitivity in young rats, 11: 854(J)

Heptane

adsorption on Hg, 11: 1010(J)

Heptane–butyl phosphate–nitric acid systems
See Butyl phosphate–heptane–nitric acid systems.

Hermex Process

chemical flowsheets, 11: 7509(R)

Hermex Process (cont'd)

development, 11: 11618, 13682(R)

dissolution of uranium in Bi-amalgam, 11: 13653(R)

equipment, flowsheets, and operating control, 11: 10474

flowsheets and chemical principles, 11: 1006(J)

fuel element design to facilitate reprocessing by, 11: 12366

fuel element solubility, 11: 13661(R)

power reactor fuel processing status report, 11: 7513(R)

process efficiency and flowsheets, 11: 7506

Heterocyclic compounds

nuclear quadrupole resonance of Cl^{35} and Br^{79} in, 11: 3029(J)

Heterogeneous reactors

(See also specific heterogeneous reactors, e.g., Brookhaven Reactor; ORNL Graphite Reactor; Swimming pool reactors; ZEPHYR.)

calculations for, with small number of blocks, 11: 682(J)

continuous fuel processing, 11: 4698

cooling, 11: 12602

core size and configuration of, heat transfer and economic considerations, 11: 6098(J)

critical size calculations, 11: 682(J), 1654(J)

design of advanced engineering test, 11: 10714

design of D_2O Th breeder, 11: 13960

design suggestions, 11: 9106

designing for stability, 11: 6914(J)

exponential studies, 11: 7845(R)

fabrication and testing of tubular fuel elements, 11: 3576(J)

fast fission factor calculations for H_2O moderated, 11: 9872

fuel recovery costs, 11: 198(J)

lattice theory, 11: 7845(R)

maximum flux obtainable in Materials Testing Reactor-type, factors influencing, 11: 9052(R)

neutron diffusion length in, method of calculating, 11: 13489

one-group diffusion theory, variational principle, 11: 3073

power density, ratio of maximum to average, 11: 10980

pulsed neutron reactivity measurements in, group theory, 11: 12892

refueling methods, 11: 4111(J), 13516(J)

screen matrices, heat transfer and friction power loss, 11: 230

stability conditions in non-linear dynamics, 11: 682(J)

transient heat generation and transfer in, 11: 13719

two-group diffusion equations, 11: 2123

uranium recovery, 11: 12388(R)

Hexane

(See also Butyl phosphate–hexane systems; Butyl phosphate–hexane–uranyl nitrate–water systems.)

radiolysis, induced by electron beam and γ rays, 11: 6676(J)

Hexane–butyl phosphate systems
See Butyl phosphate–hexane systems.

Hexanethiols

adsorption on Au, 11: 3784

1-Hexanol

chromatographic separation and identification, 11: 6297(J)

Hexogen

detonation velocity transients, 11: 909

High Performance Reactor
safety, 11: 11558
High-pressure systems
design and materials, 11: 4409(J)
design of device for study of polymorphism in, 11: 7242
equipment design, 11: 163(J)
for gases and liquids, 11: 5305(J)
physical chemistry, 11: 6638(J)
High-temperature corrosion
materials resistant to, preparation and properties, 11: 7995(J)
High-temperature reactions
in chemical processing, survey, 11: 4273(J)
equipment design, 11: 163(J)
produced by electrical explosions of metals immersed in fluids, 11: 9753
producing, containing, and studying, 11: 4279(J)
review of chemistry of, 11: 4271(J)
High-temperature reactors
heat transfer, 11: 13113(R)
High temperature separation processes
applications to U and Th–U fuels, 11: 7548(R)
for decontamination of U and U–Zr alloys, 11: 7543(R)
for decontamination of U by Ag extraction, 11: 10428(R)
development, 11: 7114(R), 13870(R)
development flowsheets, 11: 3367(J)
development for Pyrometallurgical Reprocessing Experiment, 11: 3757(R), 5261(R)
development for reprocessing irradiated reactor fuels, 11: 13581(R)
development for separation of fission product from Th fuels, 11: 6294
development for Th–U alloys, 11: 9639(R)
development for uranium, Th, and U–Th fuels, 11: 10829(R)
development of oxide-chloride conversion process, 11: 10034
development of pyrometallurgical refabrication unit, 11: 12702(R)
efficiency of fused-salt electrorefining in decontamination of Pu, 11: 10472
development of pyrometallurgical separation of U from Th, 11: 11978
equipment for uranium processing, 11: 7542(R)
extraction of molten U with UF_4, 11: 8387(R)
extraction of Pu and fission products from U by liquid metals and fused fluorides, 11: 7544(R)
fused-salt slagging, oxide scavenging, and liquid-metal extraction, 11: 13680(R)
liquid Mg and fused F^- extractions of U, 11: 7545(R)
melt refining and oxide slagging, 11: 7408(R)
molten salt extraction and volatilization of irradiated U and U–Th alloys, 11: 7546(R)
for purification of Th–Zr alloy, 11: 1128
for radiochemical separations, 11: 5252
for reactor fuels, 11: 13517(J)
separation of fission products from U–Th alloys, 11: 13292
solid and liquid slagging on Th–U alloys, 11: 8390(R)
for uranium and Pu, using Mg, 11: 7973(J)
Hiroshima
genetic effects of exposure to atomic bombs on populations of, 11: 3294(J)
Hiroshima (cont'd)
medical studies on children exposed to the atomic bomb, 11: 8763
radiation injuries of children of, exposed in utero to the atomic bomb, 11: 36(J)
Histamine
excretion, effects of irradiation, in rats, 11: 1725(R), 2233(R)
radiosensitivity effects, 11: 9965(J)
Histology
combined with radiography for study of structures with microscopic dimensions, procedures and errors, 11: 57(J)
Holmium
absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969
heat of combustion, 11: 11114(J)
ion exchange using ENTA, 11: 6302(J)
magnetic properties, 11: 4748
metallic phase transitions, 11: 8117(R)
physical and chemical properties, 11: 5816(J)
thermal capacity from 15 to 300°K, 11: 12298(J)
Holmium isotopes Ho^{160}
half life, 11: 13114(R)
isomeric transitions, 11: 10363(J)
Holmium isotopes Ho^{161}
half life, 11: 13114(R)
Holmium isotopes Ho^{163}
isomeric transitions, 11: 9518(J)
Holmium isotopes Ho^{165}
internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)
Holmium oxides
heat of formation, 11: 11114(J)
magnetic ordering in Ho_2O_3, 11: 9189(R)
Homogeneous Reactor Experiment
biological shield, safety factors and design of Barytes concrete, 11: 11823
bubble motion in, theory, 11: 13181
catalytic recombination of H_2 and O_2 in, 11: 2122
charcoal adsorber beds in, performance, 11: 8610
chemical explosions in core tank of, estimates of violence, 11: 7752
control, instrumentation manuals, and safety, 11: 13180
control element fabrication, 11: 13182
control panel, factors influencing design, 11: 2649
control rod design, 11: 7762
core mixing, gas coefficient of reactivity, and concentration effect in core at high power, 11: 7778
core tank behavior with density differences, 11: 2642
corrosion experiments, 11: 7611
criticality studies, 11: 13965
decontamination of piping systems, 11: 7775(R)
design, component testing, operation, poisoning, hydraulic systems, and fuel handling, 11: 7857(R)
design, cooling system, control, fuels, instrumentation, operation, and shielding, 11: 9863(R)
design, pumps and valves, core studies, control, and experimental programs, 11: 11801(R)

Homogeneous Reactor Experiment (cont'd)

development studies, 11: 8706(R), 11315, 12584(R), 13982(R)

feasibility study, 11: 9861

fuel circulating system, 11: 7770

fuel flow pattern in, and use of baffles in core, 11: 7757

fuel solution processing for U^{233} recovery, 11: 7502

fuel solution radiation damage, 11: 8739

gas generation and radiation damage in pump, 11: 8738

kinetic behavior of, effect of photoneutrons on, 11: 8587

kinetics, 11: 13965

let-down system, oscillation, 11: 2640

low-power criticality experiments, 11: 6091

manual on design, operation, and safety, 11: 10978

maximum power output and required core pressure for operation with 100°C soup, 11: 7764

nuclear constants, 11: 8585

operating hazards due to D_2O decomposition, 11: 3462

operation, corrosion rate, and reactivity, 11: 8708(R)

operation and reactivity, 11: 12585(R)

operation manual for, 11: 8591

oscillation of fluid level in soup dump line of, 11: 2639

pipe gas separators for, 11: 8586

pressurizers for, gas generation in, 11: 7751

pump failures, 11: 8642

radiation level measurements of fuel system components after 27-month storage, 11: 9098

radiation studies, applicability of Bulk Shielding Facility for, 11: 8622

reactivity, 11: 7858(R)

reactivity, operation, and gas disposal, 11: 8707(R)

recombination of radiolytic gases by Cu catalysis, 11: 4083

reflector, feasibility of water for, 11: 7759

reflector tank of, chemical explosions in, 11: 7754

response to reactivity increases at low initial power, 11: 7780

safety and hazard studies, 11: 13981

safety of recirculating pump, 11: 8582

steady-state operation, Cu-concentration requirement for, 11: 7761

steam power cycle and equipment, 11: 7750

temperature and power after stopping pump, 11: 8596

Homogeneous Reactor Experiment-III

mathematical analysis, equilibrium results for HRE-3 design, 11: 11315

Homogeneous Reactor Test

analytical requirements for chemical processing plant, 11: 13604

blanket, removal of Pu from UO_2SO_4, 11: 7805

blanket dump tanks and condensate tanks, testing, 11: 8649

blanket processing for removal of Pu and corrosion and fission products, 11: 7510

blanket processing system, instrumentation, 11: 9822

blanket storage tanks and reflux condenser, testing, 11: 8646

blanket volume calibration, 11: 12547

boiler feedwater pumps for, testing, 11: 10931

breeding blanket processing, mathematical analysis, 11: 12546

breeding blankets and fuel circulation systems, venting gas from backs of pumps, 11: 12879

Homogeneous Reactor Test (cont'd)

centrifuge for solids removal, feasibility, 11: 8627

charcoal adsorber beds in Homogeneous Reactor Experiment, possible use in, 11: 8610

charcoal adsorbers for fission product gases, design, 11: 11614

chemical plant for, operation of dissolver system, 11: 9621

chemical plant shakedown, design of solids feed loop for, 11: 8639

chemical process receiver tank level indicator calibration, 11: 9760

chemical processing flow sheet, 11: 7859(R)

chemical processing plant, pipe line designation table, 11: 9824

chemical processing plant evaporator studies, 11: 12538

chemical processing plant for, instrument interlocks, 11: 10930

chemical processing plant for, recombiners, 11: 10934

cold trap refrigeration system, substitutes for Freon-11 in, 11: 8643

component operation, recommendations from mock-up runs, 11: 11771

condenser system, test procedures for, 11: 10936

construction status and dump tank modifications, 11: 8625

contamination of shielding water, prevention, 11: 8659

control, effectiveness of dump operation, 11: 8624

control and safety considerations, 11: 7797

control circuit designs, 11: 7796

control of core and blanket pressures during a dump test, 11: 9818

cooling system, control, 11: 5011

cooling system evaluation, 11: 10938

cooling system modifications, 11: 9812

cooling system operating conditions, 11: 9814(R)

cooling systems, chemical cleaning, 11: 9099

cooling tower performance, 11: 9800

cooling water system, 11: 10950

core design, 11: 8617

core processing plant, design of superheaters, 11: 13622

core processing plant design, 11: 11581

core vessel, allowable pressure differentials for, 11: 12880

corrosion inhibitors for closed cooling water and cooling tower water systems, 11: 11399

corrosion problems, 11: 1863, 2109, 3395, 4088

corrosion sample data and fabrication in heat exchanger, 11: 11683

corrosion sample holders, 11: 10929

corrosion studies in, UO_2SO_4 on stainless steel, 11: 13743

critical concentration as a function of temperature, 11: 9798

critical fuel concentration, effect of corrosion sample assembly on, 11: 12878

criticality calculations, 11: 2645, 2653

criticality studies, neutron flux distribution, 11: 13984

delay time required to reduce D_2 explosion hazard during dump, 11: 8656

delayed neutron intensities, 11: 8611

design, 11: 681(J), 2654, 6092, 9826(R), 13905, 13985(R)

design, fabrication, and operation of UO_2SO_4 blanket processing plant, 11: 7805

design, for package power plants, 11: 13902

design, hazards report, and stresses, 11: 7859(R)

design, operability and safety, 11: 8624

design and criticality studies, 11: 8708(R)

Homogeneous Reactor Test (cont'd)

design and development, 11: 7861(R), 10947(R)

design and fabrication, status, 11: 13907

design and testing, 11: 10292

design and testing of auxiliaries, flow sheets, safety stability, reactivity calculations, and fuel solution processing, 11: 9869(R)

design data for core and blanket solutions, fuel and blanket loops, and other components, 11: 8600

design data sheets for, using D_2O blanket, 11: 8613

design of hydrogen recombiner and pressurizer, 11: 7320

development of components for, progress, 11: 9804(R)

development studies, 11: 643, 4692(R), 5010, 5012, 6536(R), 8631, 8629

dissolver system instrumentation, 11: 9761

drawings, cross reference listing of, 11: 9811

dump, time required for venting pressurizer during, 11: 9815

dump tank specifications, criticality factors, 11: 7791

effect of gas sampling on level control, 11: 9819

experimental physics program for, 11: 13908

experimental program from initiation to sustained operation, 11: 11400

explosion hazards in the underflow pot, 11: 12537

feed pump and purge water flow measurements, 11: 10942

fission and corrosion product removal from breeding blanket, 11: 13657

fission products in, behavior, 11: 7811

fuel additions to, method and fuel makeup, 11: 11772

fuel and blanket processing, 11: 2430, 2533, 2668, 4692(R)

fuel and blanket systems, calculated internal surface area, 11: 8660

fuel and blanket systems, cleaning procedures, 11: 8653

fuel and blanket systems, hydrostatic testing, 11: 8652

fuel charging system, engineering tests, 11: 9802

fuel circulating pump, radiation level in stator region, 11: 11398

fuel circulating system, 11: 2463, 2674, 4082, 4087, 4666

fuel circulation system, calculations of D_2 and O_2 in, 11: 8630

fuel circulation system, letdown rate vs. O_2 and Xe concentrations, 11: 9095

fuel circulation system, radiation effects on 400-A circulating pumps, 11: 6958

fuel circulation system, UO_4 precipitation in, 11: 12539

fuel circulation system, volume calibration of, 11: 9808

fuel circulation systems, composition of solids from pressurizer of mock-up, 11: 12542

fuel circulation systems, frequency response analysis of mockup pressurizer-level control loop, 11: 12870

fuel circulation systems, O_2 depletion in stagnant UO_2SO_4 lines, 11: 9094

fuel circulation systems, possibility of connected core and blanket with an open pipe, 11: 12225

fuel circulation systems pressurization control design criteria, 11: 11774

fuel recovery, 11: 13985(R)

fuel sample cooler performance, 11: 9097

fuel solution and blanket processing, 11: 7507(R), 12966(R)

fuel solution dumping, 11: 308, 2647, 2650, 2651, 2652, 2655, 2674, 4676, 5008, 6073

fuel solution evaporation for D_2O recovery, 11: 8623

fuel solution processing, 11: 1846, 2296, 5294, 6536(R), 13661(R)

Homogeneous Reactor Test (cont'd)

fuel solution processing, analytical requirements for, 11: 11616

fuel solution processing, design of test loop for studies on, 11: 8615

fuel solution processing, program outline, 11: 7508

fuel solution processing, recombiner condenser design, 11: 13137

fuel solution processing development, 11: 12321(R)

fuel solution processing plant, condensers for, 11: 10933

fuel solution processing system, plant design criteria for, 11: 8621

fuel solution radioactivity during storage in dump tanks, 11: 10944

fuel solutions, effects of O_2 addition on, 11: 13910

fuel solutions, possibility of UO_4 precipitation, 11: 8620

fuel system entrainment separator, efficiency, 11: 10941

fuel system gas separator, analysis for use as solids concentrator, 11: 9816

fuel system pressurization, 11: 11773

fuel transfer rates between inner and outer dump tanks, 11: 8632

gas disposal, recombiners for, 11: 12226

gas disposal absorber units, pressure drop vs. O_2 flow, 11: 8167

gas recombination problems, 11: 9803

gas separator, design and performance, 11: 7794, 7795

gaseous activities in irradiated fuel solutions, 11: 7793

hazards associated with pressure vessels, 11: 12588

heat exchanger blast shield, 11: 8626

heat exchanger heat loss and insulation performance, 11: 8637

heat exchanger leak tests, 11: 8636

heat exchanger operating conditions, effect on fuel solution temperature and reactivity, 11: 7801

heat exchangers, 11: 2888, 6526, 10513

heat exchangers, cleaning, 11: 8641

heat exchangers, O_2 generation from radiolysis of H_2O in, 11: 8608

heat exchangers, placement of taps for liquid level measurements, 11: 8166

heat exchangers, pressure drop calibration, 11: 10932

heat production in shield and Ar activation in cells, 11: 8607

heat removal rate from fuel reflux condenser, 11: 9797, 9799

heating in cold traps from radioactive fission product gases, 11: 13909

heating of core tank of, contribution of β particles to, 11: 7803

heating of fuel and blanket circulating systems, procedures, 11: 8655

heavy water decomposition in processing plant, 11: 3716

hydroclone design for core processing, 11: 7501

hydroclone performance, 11: 1847, 2112, 2113, 3547

hydroclone system characteristics, 11: 7809

instrumentation, comparison of electric and pneumatic transmitters in, 11: 8624

instrumentation and controls, 11: 4106(J), 4544(R)

instrumentation of chemical plant, 11: 13382(J)

instrumentation program, 11: 8612

iodine removal bed, design, 11: 12699

leak detector systems, 11: 4678, 4876, 4917, 8645, 9470

letdown valve performance in mockup, 11: 9471

loop design modification for chemical plant component, 11: 8640

loop development, 11: 10945

Homogeneous Reactor Test (cont'd)

modified refrigeration system, 11: 11401

neutron flux distributions and adjoint functions, calculation, 11: 8603

neutron leakage, mathematical analysis, 11: 8607

nuclear constants and criticality studies, 11: 11762

operating procedure for the chemical plant, 11: 11615

operation under no-load conditions, 11: 8168

poisoning effects of corrosion specimens in-core, 11: 13912

power level and fuel temperature after fuel circulation stops, 11: 8616

pressure-balancing control valve, flow characteristics, 11: 9813

pressure vessel, 11: 669(J), 680(J), 2105, 2657, 2664

pressure vessel failure in, possibility, 11: 8605

pressurizer, design of modified, 11: 10940

pressurizer design, relationship to reactor safety, 11: 8633

pressurizer heater efficiency, 11: 2108, 2669, 3064, 4081

process flowsheets, 11: 10927, 12535

radiation problem in removing rupture disc assembly after operation, 11: 9817

radioactivity induced in core specimen holders, 11: 9821

radioinduced heating and reactivity, 11: 13984

radiolytic gas production, 11: 646, 4671

reactivity and core pressure rise, "walk-away," and instrumentation, 11: 7859(R)

reactivity effects of two-phase separation, 11: 8647

reactivity transients, self-control of, 11: 13504

reactor kinetics, mathematical analysis, 11: 8624

recovery of Zr from A-loop, 11: 12965(R)

run summaries of feed loop and chemical plant, 11: 3067, 3068, 3069

safety, 11: 642, 2656, 4084, 4085, 13985(R)

sample holder for use in core of, temperature and pressure drop effects, 11: 9806

sampling device, for radioactive UO_2SO_4, 11: 9468

secondary refrigeration system, use of Freon in, 11: 8648

service systems, development, 11: 1318, 2648, 3786, 4667, 4674, 4680

shielding calculations, 11: 2110, 2646, 2664, 2665, 3618, 4086, 4668, 4669, 4670, 4679, 5015, 6526

shielding for charcoal pit and gas line, 11: 6891

source handling facilities, 11: 10951

specifications for Ti blanket, circulation and gas systems, and heat exchangers, and pressure vessel liners, 11: 8604

stability criteria, 11: 7790

startup, shakedown and cleaning, 11: 8628

temperature of core walls, 11: 7804

thermal shield for, specifications, 11: 7799

turbine condensers, test procedures for, 11: 10937

turbine generator test procedure, 11: 8644

valves, closure by freeze plugs, 11: 7800

vent value test, 11: 8650

waste disposal systems, 11: 10867

wire-mesh entrainment separators for core processing plant, design calculations, 11: 10939

Homogeneous reactors

(Moderator and fuel combined in a homogeneous mixture which may be liquid or solid. See also specific homogeneous reactors, e.g., Armour Research Reactor; Danger Coefficient Test Facility; Fluid fuel reactors; Homogeneous Reactor Experiment; Homogeneous Reactor Test; Intermediate Scale Homogeneous Reactor; Los Alamos Power Reactor Experiment; Los Alamos Water Boiler; Low Power Research Reactor; North Carolina Research Reactor; Thorium Breeder Reactor; Water boiler neutron sources.)

breeding blanket processing, 11: 13642

breeding blankets, 11: 8631, 9469

breeding blankets for, power removal from, 11: 7808

breeding blankets for, status of development, 11: 8598

breeding properties, 11: 13138

breeding ratio in large spherical, 11: 7861(R)

breeding slurries for, effect on reactor design, 11: 12877

bubble formation in, design of system to prevent, 11: 7760

centrifuge for solids removal, feasibility, 11: 8627

chemical processing for, estimation of radiation intensity, 11: 8349

circulating fluoride, uranium investment in, 11: 13911

conference on, at Oak Ridge National Laboratory, March 1956, 11: 6092

conference papers on development status, 11: 10292

control and start-up, 11: 9792

converter plate design, 11: 9795

coolant, cost factors for cooling tower and river water, 11: 12881

coolant radioactivity, 11: 12329(R)

cooling system for, tower-type, 11: 9791

core solution stability, effect of corrosion products and Cu concentrations, 11: 10283

corrosion problems, 11: 6092

corrosion problems, safety, maintenance, and gas disposal, 11: 9482(J)

cost analysis and developmental program at Oak Ridge National Laboratory, 11: 13899

cost analysis for one-region non-steady-state and several multi-region, 11: 12898(R)

critical behavior of slurries on settling, 11: 13894

critical dimensions for aqueous U^{235}, 11: 12632

critical dimensions of cylindrical, uranyl fluoride–water, 11: 8753

critical mass determinations by graphical methods, 11: 9832

criticality calculations for Th- and U-fueled, 11: 13134

criticality of uranyl fluoride solutions in, 11: 11006

criticality of uranyl nitrate solutions in right cylindrical, 11: 11007

criticality studies, 11: 682(J), 1322, 2107, 2732, 3546, 3574(J), 12584(R)

criticality studies, neutron cycle in epithermal, 11: 12597

criticality studies and group theory, hydrogen slowing-down method for, 11: 12505

design, 11: 1714(P)

design, using $D_2O-ThO_2-U^{233}O_2$ slurry in blanket and core, 11: 3546

design and cost studies of, for engineering testing, 11: 12212

design and evaluation as power-breeder, 11: 12596

design and feasibility, for research use, 11: 6907

design and feasibility of 10 Mw non-boiling, 11: 12530

design and feasibility study of 600-Mw, fused-salt fuelled, 11: 7325

Homogeneous reactors (cont'd)

design and heat transfer, 11: 13179

design development, 11: 13177

design for electric power production, 11: 13891

design for meat irradiation facility, 11: 5007

design for power production, 11: 681(J)

design in which fuel is suspended in liquid which serves as moderator, coolant, or both, 11: 5122(P)

design of, for cargo ship propulsion, 11: 11765

design of, fueled with uranium oxide suspension for power production, 11: 681(J)

design of aqueous, 11: 2775(J), 4112(J)

design of circulating fuel aqueous, for research, 11: 9804(R)

design of graphite moderated, for engineering testing, 11: 12241

design of Homogeneous Reactor Experiment-III, 11: 12898(R)

design of one- and two-region, 11: 6092

design of proposed 80,000 kw, 11: 7865

design of steam power cycle, and associated steam generating equipment for use with, 11: 8583

design of thermal, 11: 6082

design of two-zone, slurry-type fueled, 11: 1319

design of Ultimate, 11: 11397

design theory of Bi–UO_2 slurry, 11: 9771(R)

development, 11: 8581

development, characteristics, and future prospects, 11: 9112(J)

development of components, controls and instrumentation, and chemical plants for, 11: 12898(R)

development of materials and equipment for, 11: 7139(R)

development studies, 11: 645, 1661(J), 2641, 2672, 3461, 3465, 4692(R), 5577, 6074, 6520, 8706(R)

economic evaluation of organic moderated power production, 11: 12549

economics of, effects of fuel and blanket processing on, 11: 11769

enrichment, plutonium production rate, and slurry costs, 11: 8589

feasibility, discussion, 11: 6542(J)

fission product buildup in, 11: 12264(J)

fission product recoil separation in, 11: 6925(J)

fission products, Kr, Br, I, and Xe, produced in, 11: 13890

flux peaking, 11: 11402

fuel and blanket processing, 11: 657(J), 659(J), 3367(J), 3753, 4069, 4079, 4677, 4692(R), 5024(R), 5567, 6092

fuel circulation systems, 11: 12529

fuel cost studies for, 11: 7861(R)

fuel costs, 11: 1668(J), 5014

fuel processing, 11: 7417(R), 13007(R)

fuel processing for removal of volatile fission products, 11: 11638(R)

fuel recovery, 11: 7835(R), 7837(R), 11635(R)

fuel recovery, comparison of continuous and batch, 11: 11769

fuel reprocessing, 11: 7500(R)

fuel solution analysis, 11: 9599

fuel solution handling, survey of pumps for, 11: 7767

fuel solution processing, 11: 9617(R), 11609, 12543, 13641, 13675(R)

fuel solution processing, development and testing of equipment for, 11: 13644(R)

fuel solution processing, development studies, 11: 11053(R)

fuel solution processing, iodine removal, 11: 11636(R)

Homogeneous reactors (cont'd)

fuel solution processing, performance of cyclone separators, 11: 8619

fuel solution processing, survey, 11: 11603

fuel solution processing and gas disposal, 11: 7838(R)

fuel solution processing for I^{135} removal, 11: 13646

fuel solution processing for uranium recovery, 11: 12389

fuel solutions, cost factors, 11: 11770

gas disposal studies, 11: 13982(R)

gas holdup in straight-through, 11: 7753

gas separators, design criteria for, 11: 8594

gas separators in the Intermediate Scale Homogeneous Reactor, calculations of length, 11: 7782

heat exchanger design, 11: 9793, 12527

hazards associated with pressure vessels, 11: 12588

heat exchanger design, 11: 9793, 12527

heavy-water moderated, for power plant, 11: 8183(J)

high temperature aqueous, design and cost factors, 11: 11768

internal recombination, 11: 8654

internal recombination of water, 11: 14014

iodine removal system, 11: 12545

linear kinetics, 11: 10755(J)

liquid-solid cyclones for removal of PuO_2 and fission products from core and blanket solutions, 11: 7792

maintenance, 11: 10280

maximum utilization of D_2O in, 11: 13887

molten-fluoride Th–U^{233} converter for power production, design, 11: 13939

natural circulation, 11: 9820

neutron energy spectra, 11: 12884

neutron flux distribution with partially inserted control rod, theory, 11: 10288

neutron poisons in, 11: 12264(J)

plutonium production in, 11: 9847

poisoning by corrosion products and fission products, 11: 8601, 11760

poisoning by Xe^{135}, control, 11: 13904

power generation with, economics, 11: 9796

pressure shell stress analysis, 11: 10943

radiation from various fuel circuit components, calculation, 11: 13491

reactivity, effect of fission-product build-up, 11: 8584

reactivity of one-region thorium breeder, effect of slurry settling on, 11: 7802

reactivity parameters for aqueous, zero power, enriched, 11: 12262(J)

recovery of D_2O from blanket and core solutions, 11: 13643

research program at Los Alamos, 11: 13165

research programs, 11: 8631

safety, 11: 2239, 2661, 2671, 3460, 4089(R), 5026, 11558

shielding, 11: 4772(P)

shutdown, maintaining high-pressure system at temperature after dump, 11: 9801

solutions processing, 11: 8381(R), 11632(R), 11633(R), 11798(R), 13676(R)

spray cooling of, effectiveness, 11: 8576

stability criteria, 11: 7790

start-up procedure, 11: 9807

Homogeneous reactors (cont'd)

thermal, diffusion of prompt neutrons in, 11: 9485(J)

use as γ source, feasibility, 11: 7813

water recombination in, comparison of internal and external, 11: 7773

xenon poison control by iodine removal, 11: 11637(R)

xenon retention effects, 11: 9809

Hoods
See Laboratory furniture.

Hooker Electrochemical Co., Niagara Falls, N. Y.

progress reports, 11: 5189(R), 6368(R)

Horizons, Inc., Cleveland

progress reports on production of Th metal, 11: 7686(R), 13096(R), 13097(R)

progress reports on surface diffusion of metals, 11: 1131(R)

progress reports on Zr production, 11: 2513(R)

Hormones

(See also Adrenal hormones; Adrenocorticotropic hormone; Cortisone; Gonadal hormones; Gonadotropic hormones; Pituitary hormones; Steroids.)

effects on Cs excretion, 11: 11021(R)

steroid, levels in suprarenal blood of irradiated rabbits, 11: 7059(J)

thyroid, effects on recovery from I^{131} treatment in rats, 11: 5136(R)

thyroid and parathyroid, physiological effects in rats, 11: 4227(J)

Horsethief Basin Area (Idaho)

exploration, geology, and mineralogy, 11: 4438

House Rock Spring Quadrangle (Ariz.)

photogeologic map, 11: 1113(J), 1114(J), 9321(J)

HPR
See High Performance Reactor.

HRE-I
See Homogeneous Reactor Experiment.

HRE-II
See Homogeneous Reactor Test.

HRE-III
See Homogeneous Reactor Experiment-III.

HRT
See Homogeneous Reactor Test.

HTRE
(Heat Transfer Reactor Experiment.) See Initial Engine Test.

Hueco Mountain Area (Texas)

geology and uranium occurrence, 11: 1087(J)

Humidity

during thunderstorms, 11: 2615

Hurricane Cliffs Quadrangle (Ariz.)

preliminary geologic map, 11: 9320(J)

Hyaluronic acid

determination by electrophoresis or chromatography, 11: 3331(J)

radioinduced depolymerization, 11: 8859(J)

Hyaluridases

physical properties, 11: 2233(R)

Hydraulic fluids

chemical and high-temperature properties, 11: 8826(R)

development of high-temperature stable and radiation resistant, 11: 11133(R)

Hydraulic fluids (cont'd)

high-temperature properties, 11: 12670(R)

high-temperature, testing of materials for, 11: 4419(R)

oxidation, 11: 910(R)

properties of aromatic ethers, 11: 3370(R)

radiation effects, 11: 11469, 12693(R)

synthesis of high-temperature alkylated polyphenyl compounds, 11: 4378(R)

synthesis of phenylmethylchlorofluoro and phenylmethylfluoroethoxy-, 11: 12712(R)

Hydraulics

(Theory and systems, including fluids. See also Fluids; Pumps; Valves.)

mathematics of water ejection from vertical channels, 11: 8178

operating control using remote-control equipment, 11: 11149

pressure resonance in fluid-filled cavities, 11: 2441

theory of hydrodynamical stability, 11: 4194(J)

Hydrazine

influence of, on Bismuth Phosphate Process extraction step, 11: 9622

radiation effects, 11: 10986(R)

scavenger for oxygen in Homogeneous Reactor Test, 11: 2109

Hydrazine borates

chemical properties, 11: 8715(R)

Hydrazine, (2,4-dinitrophenyl)-

reactions of irradiated pepsin solutions with, formation of >C = O bonds in, 11: 11920

Hydrazyl, diphenylpicryl-

paramagnetic resonance, 11: 11576(R)

Hydrides

(See also hydrides of specific elements and Alkali metal hydrides; Borohydrides.)

identification in $Zr-H_2$ and Zircaloy-2-H_2 systems, 11: 4464(R)

moderating properties, 11: 1703(J)

neutron scattering cross sections of Zr, Ti, and Pd, 11: 10232(R)

physical properties of, summary of data, 11: 1183

review of solid, 11: 13516(J)

Hydriodic acid

exchange reactions with I_2, 11: 3329

Hydroaromatic compounds

disulfides, absorption spectra, 11: 4813

infrared spectra of p-disubstituted nitrobenzenes, 11: 1490(J)

proton-proton nuclear spin-spin coupling in, contribution of π-electrons, 11: 10227(J)

radiation effects, 11: 960(J), 12984, 12985

radiation effects, reversible color modifications in bianthrone and spiropyrans, 11: 7131

thermal decomposition, 11: 12331(R)

Hydrobromic acid

density of D-labeled, 11: 1454

hydrogen isotopic exchange, 11: 138(J), 11097(J)

preparation and analysis, 11: 138(J)

preparation and analysis of D-labeled, 11: 11097(J)

preparation by H_2-Br_2 reaction at elevated temperatures, kinetics, 11: 1424

Hydrobromic acid (cont'd)

reactions with $PuO_2 \cdot xH_2O$ at 700°C, 11: 10838(R)

Hydrocarbon films

preparation of thin, 11: 5532

Hydrocarbon–fluorocarbon systems
See Fluorocarbon–hydrocarbon systems.

Hydrocarbons

(See also specific compounds and classes of compounds.)

analysis for sulfur by tritium bremsstrahlung determination, 11: 7116(J)

flash point, relation to vapor pressure, 11: 2250

gaseous, chromatographic separation and analysis, 11: 113(J)

neutron age of, for moderators, 11: 8687(R)

nuclear spin-spin coupling in, 11: 7314(J)

oxidation and vicosity, 11: 910(R)

physical properties of, as reactor shield coolants, 11: 8687(R)

properties and diluents, 11: 8371

proton and helium ion cross sections from 25 to 375 kev, 11: 5532

radiation chemistry, 11: 960(J)

radiation stability of aromatic, temperature effects, 11: 3558

reactions with iodine, radiation effects on, 11: 3743(J)

reduction of uranyl sulfate by, 11: 12704

solvent properties for U extraction from pregnant solution, 11: 12704

storage safety, effect of flash point, 11: 2250

Hydrochloric acid

acidity function vs. temperature, 11: 5768(J)

corrosive effects on Ti and Ti alloys, 11: 7185

distillation of $HCl-Cl_2$ and $HCl-ClF_3$ systems at low temperature, 11: 9210

elution of metal ions on, 11: 11574(R)

exchange reactions with Cl on glass and fluorocarbons, 11: 1423

solvent properties for Ti, Hf, Zr, and Th, 11: 4470(J)

solvent properties for UO_2Cl_2, 11: 13580(R)

vapor-liquid equilibria of $HCl-H_2O$ systems, 11: 10437(J)

Hydrochloric acid–butyl phosphate systems
See Butyl phosphate–hydrochloric acid systems.

Hydrochloric acid–nitric acid systems

corrosive effects of boiling on Ti, Ta, and Pfaudler No. 53 glass-lined stainless steel and Hastelloy-F, 11: 12321(R)

corrosive effects on Ta, 11: 12965(R)

vapor-liquid equilibria of $HCl-HNO_3-H_2O$ systems, 11: 10437(J)

Hydrofluoric acid

absorption of waste anhydrous, by $Ca(OH)_2$ slurry and limestone bed, 11: 8431

anode reaction in fluorination of carboxylic acids, 11: 3723(J)

concentration by electrodialysis, 11: 11648

conductance and transference numbers, 11: 149(J)

corrosive effects on alloys and metals, 11: 13055(R)

corrosive effects on anodes in Excer Process, 11: 7494

corrosive effects on Au alloys, 11: 2486

corrosive effects on metals and alloys, 11: 8457

corrosive effects on metals and plastics, 11: 12459

distillation, 11: 8381(R)

distillation of $HF-Cl_2$ and $HF-BrF_3$ systems at low temperature, 11: 9210

Hydrofluoric acid (cont'd)

electric conductivity and purification, 11: 11563(R)

electronic wave functions, calculations, 11: 4490(R)

electronic wave functions for molecule, 11: 6855(R)

exchange reactions of hydrogen with, 11: 13278(J)

flow, measurement, 11: 6661

Hammett acidity function for solutions, 11: 10457(J)

infrared spectrum, 11: 151(J), 2268

infrared spectrum and molecular constants of gaseous tritium fluoride, 11: 10011(J)

ionization potentials and ground state of HF^+ ion, 11: 8853(J)

micro-analysis, 11: 111(J)

preparation by action of H_2SO_4 on CaF_2 or MgF_2, 11: 10812(R)

preparation of pure liquid deuterium enriched, 11: 10010(J)

reaction with UO_2 to produce UF_4, 11: 11663

reaction with uranyl phosphates, 11: 8429

recovery from $HF-H_2O$ azeotropes by electrodialysis, 11: 1794

recovery from its aqueous solution, 11: 10854

recovery from UO_2 fluorinating plant, 11: 12338

recovery of anhydrous, by distillation, 11: 10830

removal from F_2, equipment design, 11: 5254

solvent properties for chlorine trifluorides, 11: 8303

solvent properties for Ti, Hf, Zr, and Th, 11: 4470(J)

solvent properties for UF_4, 11: 12971(R)

thermodynamic properties, 11: 4319(J)

toxicity and handling, 11: 985

ultraviolet band system, 11: 4834(J)

wave functions for, 11: 11254(R)

Hydrofluoric acid (labeled)

ultraviolet band system, 11: 4834(J)

Hydrofluoric acid–aluminum nitrate–nitric acid–thorium nitrate systems
See Aluminum nitrate–hydrofluoric acid–nitric acid–thorium nitrate systems.

Hydrofluoric acid–bromine fluoride systems
See Bromine fluoride–hydrofluoric acid systems.

Hydrofluoric acid–chlorine fluoride systems
See Chlorine fluoride–hydrofluoric acid systems.

Hydrofluoric acid–nitric acid systems

corrosive effects on stainless steel, 11: 3813, 7610

solvent properties for Th and ThO_2, 11: 11493

Hydrofluoric acid–sodium fluoride systems

vapor pressures from 14.6 to 207°C, 11: 2287

Hydrofluoric acid–sulfuric acid systems

corrosive effects, 11: 13698(R)

fractionation for recovery of anhydrous HF, 11: 10830

Hydrofluoric acid systems

acid-base behavior of inorganic fluorides in, 11: 12681(J)

solubility of Nb and Ta in $HF-H_2O_2$ mixtures, 11: 1917(J)

solvolysis and stoichiometries of salts of fluoro acids in, 11: 12682(J)

Hydrofluoric acid–zirconium systems

determination of Zr and total F ion, 11: 11589

Hydrogen

absorption by metallic U and U hydrides, 11: 4390

absorption by U, 11: 7659(R)

Hydrogen (cont'd)

absorption by cold-worked iodide Zr and Ti, 11: 12898(R)

adsorption and mobility on W, 11: 7150(J)

adsorption on Ni layers condensed in high vacuum, 11: 11991(J)

analysis for N_2, 11: 7108

antiproton cross sections, 11: 10710(J)

bonding, 11: 10019(J)

capture of stopped negative pions by, 11: 9038(J)

catalytic oxidation, 11: 2122, 2671, 3461, 4265, 4674, 7859(R), 9869(R), 12584(R), 13985(R)

catalytic oxidation and solubility, 11: 8707(R)

catalytic oxidation in reactor solutions, 11: 13982(R), 14014

catalytic recombination with O_2, 11: 8706(R), 12585(R)

cooling properties for UH_3 multiplying systems, 11: 4768(J)

cross section for the 1s−2s excitation by electron impact, variational calculation, 11: 8161(J)

cross sections in 1,3-butadine−water mixtures, 11: 3027

cryogenic data, 11: 386

detection in alpha-uranium, 11: 10503(J)

determination by thermal conductivity method, 11: 2826

determination in He, 11: 7429(R), 13969(R)

determination in Na−K alloys, 11: 2264

determination in Ti and Ti alloys, various methods for, 11: 1432(R)

determination in U, minutes of meeting on, 11: 7643

deuterium determination after reduction of water to, 11: 5759

deuteron scattering by, 11: 10708(J)

diffused, influence on potential of Fe in NaOH, 11: 5193(J)

diffusion in metals, effect of surface coatings on, 11: 5307, 6422

diffusion in H_2O-D_2O, mechanism, 11: 8985(J)

diffusion on Ni surface, 11: 7100(J)

diffusion through active and inactive Pd, mechanism, 11: 12757

effects of atomic, on silver, cystein, and glutathione solutions, 11: 11076(J)

effects on corrosion of metals in water, 11: 7993(J)

effects on delayed failure in Al−Mn−Ti alloys, 11: 5897

effects on low-cycle fatigue of high strength steel, 11: 10568

effects on mechanical properties of Al−Ti alloys, 11: 11215

effects on mechanical properties of Zr, 11: 3419

electron capture by protons passing through, 11: 5060(J)

electron collision partial cross sections for the 1s−2s and 1s−3s transitions of atomic, 11: 10270(J)

electron elastic scattering cross sections, zero energy limit, 11: 13470(J)

electron loss from atoms of, passing through He, 11: 7354(J)

electron scattering by, 11: 1367(J), 4737(J)

embrittlement of stainless steels and Be−Cu alloy by, 11: 1532(J)

embrittlement of Ti alloys contaminated with, 11: 2924

energy levels, measurements, 11: 3014(J), 11261(J), 13464(J)

evolution from metals, kinetics, 11: 5908(J)

evolution from water and H_2SO_4 during pile irradiation, 11: 12330(R)

evolution in homogeneous reactors, 11: 963

exchange between D_2 and D_2O, radiation effects on, 11: 3348(J)

exchange rate between aromatic hydrocarbons and liquid DBr, 11: 1792(J)

Hydrogen (cont'd)

exchange reaction with hydrofluoric acid, 11: 13278(J)

exchange reactions with D_2O, catalysis, 11: 8557(R)

exchange with D_2, separation factor, 11: 136(J)

excitation of discrete levels of atomic, by fast electrons, 11: 9088(J)

excitation of fast He atoms by, 11: 5064(J)

explosion hazards, 11: 985

gamma scattering from 50 to 130 Mev, 11: 5655(J)

gasometric determination in Pu, U, and Zr, 11: 3339

ground state energies, 11: 11254(R)

ground state of molecule, configuration interaction calculation, 11: 6855(R)

high resolution Raman spectroscopy, 11: 9174(J)

hypernucleus, nuclear interaction of, 11: 12188(J)

hyperons produced by 1.3-Bev π^- mesons, 11: 527(J)

influence on corrosion of Fe and steels by hot pressurized water, 11: 3248(P)

interactions, K^- mesons, 11: 12161

interactions with He atoms, potential energy, 11: 740(J)

intermolecular forces, short range, between H_2-H_2 and H_2-H, 11: 6646(J)

ionization coefficient, 11: 1293(J), 4016(R), 5063(J)

isotope shift, finite volume effect, 11: 7294(J)

isotopic chemical effects, 11: 1542(R), 9186(R)

isotopic exchange, evaluation of experimental data, 11: 139(J)

isotopic exchange reactions in resins, 11: 13588

K^- meson interactions in, 11: 9032(J)

K-particle elastic scattering, 11: 526(J)

liquefaction and thermodynamic properties, 11: 13374

mass measurement in mass spectrograph, 11: 619(J)

mass spectrographic analysis for D, 11: 9381(J)

meson (K^-) cross section in, 11: 5998(J)

meson(π^+) production in, by 660 Mev protons, 11: 12832(J)

meson(π^+) scattering at 176 to 307 Mev, phase shift analysis, 11: 12831(J)

meson (π^-) scattering by, from 10 to 30 Mev, 11: 4596(J)

migration in Zircaloy-2, 11: 11227

molecular structure, isotope effects, 11: 11562(R)

neutron attenuation in, 11: 1618(R), 6557, 13425(J)

neutron capture cross sections, 11: 11740(R), 13965

neutron cross sections, 11: 11739(R)

neutron cross sections, multigroup, 11: 12284

neutron scattering by, 11: 547(J), 5666(J)

neutron spectra in, mathematical analysis, 11: 14025

nuclear combustion, 11: 4775(P)

nuclear reactions (d,He^3), μ meson catalysis of, 11: 13523(J)

nuclear spin relaxation in solid, near the melting point, 11: 13450(J)

nuclear spin relaxation of gaseous, 11: 6066(J)

ortho-para conversion, 11: 11051

ortho-para conversion, effects of hydrous iron oxide catalyst on, 11: 12305

oxidative removal from linear polyethylenes up to 210°C, 11: 10807

permeation through molten NaOH and Cu, 11: 13825(R)

Hydrogen (cont'd)

photon reactions (γ, meson), 11: 11337(J)

photopion production in deuterium relative to that in, 11: 8197(J)

photoproduction of π^0 mesons in, from 150 to 240 Mev, 11: 5992(J)

photoproduction of pion pairs in, 11: 3003(J), 5050(J), 5631(J)

physical effects on α-β titanium alloys, 11: 330(R)

pion production by inelastic scattering of electrons in, 11: 4598(J)

pions scattered by, angular distributions, 11: 5664(J)

properties as a reactor coolant, 11: 5839

proton scattering at medium energies by, differential cross sections, 11: 4993(J)

proton structure and hyperfine shift in, 11: 3056(J)

proton total cross section at 134 Mev measured by absorption in liquid H target, 11: 758(J)

protons in, variational calculation of magnetic shielding, 11: 1651(J)

pulse discharge in, spectroscopic studies, 11: 433(J)

purification by adsorption of N from gas streams on silica gel at low temperatures, 11: 11989

radiation chemistry, mechanisms of, 11: 11953(J)

radiochemical production, 11: 1462

radiolytic yields from $UO_2(NO_3)_2$ solutions in water boilers, 11: 3598(J)

rates of reaction with hydroxyl radicals in $HClO_4$, 11: 11947

reactions with bromine at elevated temperatures, kinetics, 11: 1424

reaction with Th at 400°C and atmos. pressure, 11: 7421

recombination with O_2 in a high pressure loop, 11: 4089(R)

recombination with O_2, ionic catalysts for, 11: 13584

reflex discharges, 11: 9364

scattering in He, 11: 741(J)

scattering of $\pi^{\pm}$ mesons at 300 Mev by, 11: 6136(J)

separation by electromigration, 11: 11648

separation from D_2 by reaction of Fe with steam, 11: 5275(J)

solubility and diffusion in Zr and Zr–O systems, 11: 5909(J)

solubility in biphenyl, isopropyl- at atmospheric pressure and temperatures to 125°C, 11: 5406

solubility in diborane, 11: 77

solubility in Fe and U, effect of vacuum on, 11: 1520

solubility in metals, bibliography on, 11: 4878

solubility in Nb, Pd, and Ta, 11: 5333

solubility in nonpolar solvents, 11: 6660(J)

solubility in U between 1000 and 1208°C, 11: 7660(R)

sorption on U, studies, 11: 13782(R)

thermal conductometric determination in Ar–H systems, 11: 10000(J)

thermal conductometric determination in H_2–N_2 mixtures, 11: 2272, 10000(J)

thermodynamic and transport properties for H–H_2 system, 11: 8969

transport in solid steel due to an electric field, 11: 10570(J)

vacuum fusion determination in metals, 11: 4826, 7629(R)

vacuum fusion determination in metals and B and Si, 11: 4308(J)

viscosity of mixtures of H_2 and HD between 14 and 300°K, 11: 13417(J)

yield from water radiolysis, nitrate ion effect on, 11: 5201(J)

Hydrogen (liquid)

boiling in short narrow channels and use as magnet coolant, 11: 6338(J)

cryogenic data, 11: 386

Hydrogen (liquid) (cont'd)

explosion report, Oak Ridge National Laboratory, 7-31-56, 11: 9575

gamma scattering cross sections below neutral meson threshold, 11: 9069

π-meson photoproduction cross section in, 11: 6484(J)

nuclear spin relaxation, 11: 9087(J)

production by ortho-para conversion, 11: 12305

storage and transport, vessels for, 11: 7979(J)

storage vessels, design, 11: 7980(J)

two-phase flow in horizontal tubes, 11: 1851(J)

Hydrogen–argon systems
See Argon–hydrogen systems.

Hydrogen–beryllium systems
See Beryllium–hydrogen systems.

Hydrogen burners

design, 11: 12584(R)

design for water and D_2O recombination, 11: 8706(R)

Hydrogen–carbon dioxide–oxygen systems
See Carbon dioxide–hydrogen–oxygen systems.

Hydrogen compounds

moderating properties, method of measurement, 11: 13357

neutron slowing down distributions, 11: 682(J)

proton magnetic resonance in, 11: 9070(J)

Hydrogen–deuterium systems
See Deuterium–hydrogen systems.

Hydrogen halides

bonding, 11: 10019(J)

Hydrogen ion concentration

determination, 11: 1428, 2826, 5207, 6250

determination in Purex solutions, 11: 14020(R)

measurement of low-level, 11: 13599(R)

Hydrogen ions

dissociation of diatomic, 11: 5641(J), 9189(R), 11259

formation of negative, by collisions of protons with gas molecules, 11: 2177

impact on Ni surfaces, electromagnetic radiation from, 11: 3193(J)

scattering in He, Ne, and Ar of low-energy H^- ions, 11: 9501(J)

thermodynamic properties, calculation of ideal-gas, 11: 12788

Hydrogen isotopes

catalysis of nuclear reactions between, by μ^- mesons, 11: 6937(J)

electrolytic separation, effect of O_2 and depolarizers, 11: 7254(J)

exchange, mathematical calculations of experimental data, 11: 948(J)

exchange between naphthalene and deterium bromide, deuterium distribution coefficient, 11: 140(J)

exchange reactions between H_2 and NH_3, 11: 3347

isotopic exchange reaction in liquid deuterium fluoride, 11: 10010(J)

separation, 11: 9664(R)

separation by electrolysis, effect of cathode metal on, 11: 10158(J)

separation by thermal diffusion, 11: 13575(R)

separation factor during distillation from salt solutions in H_2O–D_2O, 11: 5226(J)

Hydrogen isotopes H^2
See Deuterium.

Hydrogen isotopes H^3
See Tritium.

Hydrogen–magnesium systems
compound formation and diffusion rates, 11: 3325(R)

Hydrogen moderated reactors
(See also Homogeneous reactors; Water moderated reactors.)
criticality and flux calculations, 11: 8184(J)
neutron flux distribution, mathematical analysis, 11: 1654(J), 6463

Hydrogen–nitrogen systems
thermal conductometric analysis for H, 11: 10000(J)

Hydrogen–oxygen systems
detonation effects on metal discs, 11: 1541
explosive limits, 11: 7857(R)
recombination, 11: 11801(R)
recombination in irradiated static water systems, 11: 10818

Hydrogen–oxygen–water systems
catalytic recombination, 11: 2122, 2671
detonation pressures at high-temperatures and pressure, 11: 5185
explosion and combustion hazards, 11: 74(R), 75(R), 1214, 3460
explosive limits with He, 11: 3462
ignition reactions at elevated temperatures, 11: 905

Hydrogen peroxides
catalytic decomposition in alkaline solutions, 11: 2298
corrosive effects on U and other metals, 11: 8450(R)
corrosive effects on U coatings, 11: 7655(R)
decomposition by gamma radiation, 11: 7405(R)
decomposition in UO_2SO_4, 11: 7857(R), 12585(R)
decomposition of vapor, homogeneous, 11: 7103(J)
polarographic determination, 11: 12970(R)
radiation chemistry, 11: 7455(R)
reactions with uranyl sulfate, kinetics, 11: 8284(R)
solubility of Nb and Ta in $HF-H_2O_2$ mixtures, 11: 1917(J)
toxicity and explosion hazards, 11: 985
vapor glow discharge, paramagnetic resonance of products formed at low temperature, 11: 9239(J)
warming curves, 11: 6242(J)

Hydrogen selenides
thermodynamic functions of H_2Se, HDSe, and D_2Se, 11: 6653(J)

Hydrogen sulfide–water systems
corrosive effects on Fe, organic inhibitors for, 11: 5101(P)

Hydrogen sulfides
corrosive effects on steel, 11: 12466(R)

Hydrogen systems
explosive limits of H_2–air–nitrogen oxide mixtures, 11: 12105

Hydrogen–tantalum systems
thermodynamic properties, 11: 3423(R)

Hydrogen tellurides
thermodynamic functions of H_2Te, 11: 6653(J)

Hydrogen–thorium systems
dissociation pressure, 11: 8492(R)

Hydrogen tritides
beta emission effects on molecular structure, 11: 4016(R)

Hydrogen–uranium systems
analysis for H, 11: 7659(R)

Hydrogen–uranium systems (cont'd)
critical mass, 11: 13831
dissociation at high pressure, 11: 8886(J)
dissociation pressures at high temperatures, 11: 4394
phase studies, 11: 4390, 13516(J)

Hydrogen–water systems
corrosive effects on reactor materials, 11: 8715(R)
vapor condenser design, 11: 12014(J)

Hydrogen–zirconium systems
hydrogen pressure relationships in, 11: 1926(J)
microstructure and hydride identification, 11: 4464(R)
thermodynamic properties, 11: 10563

Hydrogenation
of metals, apparatus for, 11: 12456(R)

Hydromagnetic waves
in atomic nuclei, 11: 11353(J)
description of, in plasma, 11: 10137
equations of motion in completely ionized plasma, 11: 8550
mathematical analysis of, in a plasma, 11: 11285
mathematical analysis of exact non-linear plasma oscillations, 11: 11286
mathematical treatment, 11: 2424
relativistic study, 11: 7377(J)
structure in plasma of infinite conductivity, 11: 428(J)
theory of motion, 11: 7374
structure of steady shock in, one-fluid theory, 11: 12758
theory, review, 11: 12086(J)
time-dependent cylindrical, flow for media with scalar conductivity, 11: 11284

Hydrometallurgy
ion exchange in, engineering aspects, 11: 2928(J)
physical chemistry, aspects of, 11: 4277(J)

Hydroxides
(See also hydroxides of specific elements and Alkali metal hydroxides; Alkaline earth hydroxides; Ammonium hydroxides; Rare earth hydroxides; Reactor fuels (fused hydroxides).)
fractional precipitation with ammonia, 11: 99(J)
leaching with Na_2CO_3 for U extraction from metal, 11: 2394
thermal self-decomposition, 11: 12456(R)
volumetric determination, 11: 2826

Hydroxyl ions
ground state energies, 11: 11254(R)
reaction with $Hg(NO_3)_2$, O^{18} study of, 11: 1013
spectrographic measurement of mean rotational temperatures, 11: 6265(J)

Hydroxyl radical
rates of reaction with H_2, HD, and D_2, 11: 11947

Hydroxylamine
physical and chemical properties, reactions with diborane, 11: 80

Hyperfragments
analysis, from strange-particle interactions, 11: 11335
binding, theory, 11: 6983(J)
binding energy, 11: 3534(J), 4029(J), 4632(R), 5505(J), 10671(J)
decay of Σ^+-proton fragment, 11: 12170(J)
disintegration, 11: 9418(J), 10130(J)

Hyperfragments (cont'd)

emission from cosmic ray stars, slow, 11: 10596(J)

formation and decay, 11: 522(J)

lifetime of H^3_Λ, 11: 5506(J)

mesonic decay of Li^7, 11: 1283(J)

model of the strong couplings, 11: 10217(J)

non-mesonic decay of He^4, 11: 4620(J)

nuclear interaction of hydrogen hypernucleus, 11: 12188(J)

parity conjugation, 11: 2998(J)

Hyperons

asymmetries of angular distributions of, from pion-nucleon and nucleon-nucleon collisions, 11: 1615(J)

decay, composite model for new unstable particles, 11: 7284(J)

decay, isotopic spin selection rule, 11: 7293

decay schemes, isotopic spin selection rule $/\Delta I/ = \frac{1}{2}$ for strange particles, 11: 11338(J)

decay theory, 11: 522(J), 579(J), 1661, 2006(J), 2011(J), 2013(J), 2014, 2946(J), 3002(J), 3986(J), 4002(J), 4614(R), 6865(R)

decays and properties of, conference on, 11: 5504(J)

emission in K^--nucleon collisions, theory, 11: 6869

force between nucleons, 11: 568(J)

high-energy kinematics of, data on, 11: 6867

interactions with mesons, symmetry operations of Hilbert space and selection rules, 11: 12164(J)

interactions with nucleons, study from K-meson capture in H and D, 11: 3995(J)

magnetic moments and masses of Σ, relation to charge independence, 11: 6852(J)

mass difference of Σ, 11: 6846(J), 8117(R)

masses of, 11: 5479(J), 6843(J), 13397

model of the strong couplings, 11: 10217(J)

parity nonconservation in decay of, 11: 10210(J)

parity of, from a strong reaction, 11: 12829(J)

pion interactions with, non-local models, 11: 7301(J)

present knowledge on, survey, 11: 8108(J)

production, cloud-chamber study, 11: 3002(J)

production, properties, and interactions, conferences on, 11: 6506(J)

production by π^- mesons of 4.5 Bev/c, 11: 9035(J)

production in nuclear emulsions, 11: 2948(J)

production in p-d and p-p reactions, 11: 6493

production in pion-nucleon and nucleon-nucleon collisions, 11: 1615(J)

production of strange, by π^- mesons on protons, 11: 9037(J)

production via secondary pions by proton bombardment of deuterium, 11: 8198(J)

properties of, 11: 527(J), 1286(J), 3000(J)

research on, review, 11: 15(J), 1940(J)

scattering by nucleons, cross sections, 11: 6845(J)

spin determination of, 11: 12836(J)

symmetries in interactions, 11: 8120(J)

theory, 11: 4210(J), 9410(J), 12167(J)

violation of charge independence in strong interactions, 11: 13400(J)

Hyperons (Λ)

binding energies, 11: 4029(J), 4620(J), 5505(J)

decay, identification of particles from, 11: 12174(J)

Hyperons (Λ) (cont'd)

decay schemes and production, 11: 12161

dipole moment of transitions, 11: 10198(J)

disintegration of, 11: 1258(J), 4204(J), 4205(J)

distributions in $K^- + p$ collisions, 11: 1632(J)

energy distribution of, 11: 1549(J)

nucleon interactions, 11: 9419(J), 10671(J)

parity nonconservation detection in decay, 11: 10222(J)

production, 11: 1258(J), 4204(J), 5475(J)

production in hyperfragments in strange-particle interactions, 11: 11335

spin, 11: 3987(J), 3999(J)

spin, decay, and binding energy, 11: 9418(J)

Hyperons (Λ^0)

asymmetries in decay of, 11: 10209(J)

parity violation and spin, 11: 10205(J)

systematics of decay, 11: 10206(J)

Hyperons (Σ)

capture of, in nuclear emulsion with no visible interaction, 11: 3979(J)

decay probabilities, 11: 5486(J)

decay schemes, tables for transformations from laboratory to rest systems, 11: 11334

decay schemes and production, 11: 12161

decay spectra and branching, 11: 10197

interactions with K^- mesons producing hyperfragments, 11: 11335

lifetime and decay, 11: 12068(R)

lifetimes for positive, 11: 10673(J)

mass, 11: 534(J), 535(J), 4615(R), 5468(J), 5471(J), 5479(J)

parity nonconservation detection in decay, 11: 10222(J)

production, 11: 1632(J), 5471(J), 5475(J)

production by interaction of pions with hydrogen, cross sections and charge independence, 11: 12828(J)

production by K^- particle capture by bound and free protons in emulsion, 11: 10668(J)

production in nuclei by K^- mesons, optical model for, 11: 10669(J)

production of charged, from 1001 K^- meson stars, 11: 10670(J)

range-energy and range-momentum curves, 11: 12281

Hyperons (Ξ)

decay, 11: 3988(J)

range-energy and range-momentum curves, 11: 12281

symmetry between nucleons and, expressed by use of vectorial charge displacement, 11: 12165(J)

Hypophosphites

nickel reductions from solutions of, 11: 7200(J)

Hypoxia

See Anoxia.

Hypsometers

applications in determinations of variations in apparent gravity with altitude in atmosphere, 11: 11245

Ice

oxygen (O^{18}/O^{16}) ratios, variations of, 11: 5374(J), 8001(J)

Ice (cont'd)

paramagnetic resonance, 11: 11576(R)

radiation effects, 11: 7405(R), 7455(R), 8266(R), 8284(R)

radioinduced luminescence, 11: 7406(R), 9579(R), 13578(R)

Ice-d_2

neutron-diffraction analysis, 11: 3712(J)

Idaho

exploration for Th and radioactive black mineral deposits, 11: 3825

exploration of Camp Creek Placer Area in Blaine and Camas Cos., 11: 3824

uranium occurrence in black shale deposits of, 11: 3409(J)

Idaho (Blaine Co.)

exploration of Rock Creek Placer Area in, 11: 4439

Idaho (Boise Co.)

exploration of Boise Basin monazite placers, 11: 4865

Idaho (Valley Co.)

exploration of Bear Valley District in, 11: 3821

exploration of Beaver Creek Placer Area in, 11: 3822

exploration of Big Creek Placer Area, 11: 4437

exploration of Corral Creek Placer Area, 11: 3823

exploration of Horsethief Basin area, 11: 4438

placer deposits in Pearsol Valley in, 11: 4866

Idaho Chemical Plant
See Arco Chemical Plant.

Igneous deposits (Ariz.)

occurrence in Mohave Co., 11: 6354

Igneous deposits (Nev.)

occurrence in Atlanta District, 11: 4863

Igneous rocks

dating of, by measurement of $Ar^{40}-K^{40}$, 11: 287(J)

nitrogen isotope abundance ratio in, 11: 10626(J)

uranium and thorium in allanites of, 11: 9291(J)

Illinois Inst. of Tech., Chicago

progress reports on metal diffusion, 11: 3832(R)

progress reports on preparation of boron hydrides, 11: 8821(R)

Illinois Inst. of Tech., Chicago. Armour Research Foundation

progress reports on desensitization of Zr powder, 11: 3833(R)

progress reports on development of oxidation- and liquid-sodium-resistant brazing alloys, 11: 275(R), 4460(R), 7196(R)

progress reports on efficiency of scavenging devices for fall-out, 11: 6466(R)

progress reports of graphite technology, 11: 12686(R)

progress reports on Laves-type intermediate phases, 11: 4885(R)

progress reports on measurements of thermal properties, 11: 1527(R) 2937(R), 6382(R)

progress reports on Ti-base alloys, 11: 1884(R), 1886(R), 6391(R)

Illinois. Univ., Urbana

progress reports, 11: 12024(R)

progress reports on ceramic structural adhesives, 11: 1514(R)

progress reports on diffusion in metals, 11: 11194(R)

progress reports on synthesis of high-temperature polymers, 11: 209(R)

Illinois. Univ., Urbana. Digital Computer Lab.

progress reports, 11: 10160(R), 10161(R)

progress reports on computer research, 11: 476(R), 477(R)

Illinois. Univ., Urbana. Electrical Engineering Research Lab.

progress reports on development of microwave equipment, 11: 3874(R), 6854(R), 11296(R)

Imides

titration in acetone using tetra-alkyl ammonium hydroxide, differentiating, 11: 8846(J)

Immunity

radiosensitivity of, to bacterial infection, 11: 1724, 2782(J), 7060(J), 11020, 11027(J), 11028(J), 12641

Immunization

effects on phagocytic index, 11: 2777

Impact shock

(See also Shock waves.)

Hugoniot, of air, 11: 9348(J)

mathematical analysis, in elastic-plastic steel beams, 11: 2549

mathematical analysis for an elastic system on a rigid foundation, 11: 2547

test equipment, 11: 1507

theory and mathematical analysis, 11: 228

transmission in two degree series mechanical systems, 11: 13726

Impactors
See Cascade impactors.

In-pile loops

analysis for corrosion products in, 11: 268

capillary tubing failure, 11: 9736

cleaning, 11: 13756

corrosion and fission product behavior, 11: 7507(R)

decontamination of, 11: 11252

design, for fuel element cycling, 11: 8721

design and fabrication, 11: 5367

design and operation in Materials Testing Reactor, 11: 2697, 6104(J), 9869(R), 13730

development of slurry, 11: 1862

fabrication and testing of Zircaloy-2 NRX Reactor Central Thimble, 11: 10301

indium, use as γ source, 11: 14027

leak due to HNO_3 corrosion, 11: 10079

membrane demineralizer testing in pressurized, 11: 1072

neutron flux and γ heating in ORNL Research Reactor, 11: 11776

operation of corrosion, in Materials Testing Reactor mockup, 11: 9289

performance in Liquid Metal Fuel Reactor, 11: 7738(R)

performance of C steel$-H_2O$, 11: 4166

preliminary design study for proposed Pu, 11: 2659

pressure drop characteristics, 11: 13721

pumps for, testing, 11: 10866

reactivity load calculations for NRU reactor, 11: 10726

sampling device for, 11: 7139(R)

stresses in evaluation of, 11: 13336

test results on a heater-cooler unit for the ORNL Research Reactor, 11: 10725

thimble of Zircaloy for, extrusion, 11: 1521

Incinerators

design, for radioactive waste disposal, 11: 3886(R), 12454, 13732

Incompressible flow

(See also Compressible flow.)

average quantities in nonuniform stream, analysis, 11: 1037

Inconel

See Nickel alloys.

Indexes

punched card methods, application to fatigue test data, 11: 1047, 1048

punched card methods, application to geologic data on U sandstone deposits, 11: 5864(J)

India

nuclear energy program and the Trombay reactor, 11: 7335(J)

Indium

alpha reactions, 11: 12855

carrier-free separation of Sn^{113} from deuteron-bombarded, 11: 6305(J)

chemical behavior at tracer concentrations, 11: 3325(R)

chemical separation, 11: 1475(R)

Coulomb excitation, 11: 573(J)

electrode potentials from 15 to 70°C, 11: 8286(R)

electrodeposition on Th, 11: 13783

energy levels, 11: 1542(R)

isotope shift in arc spectrum, 11: 10467(J)

metabolism in rats, tracer studies, 11: 10424

neutron reactions (n,γ), 11: 9752(R)

neutron resonance scattering and transmission measurements, 11: 10770

polarographic determination in Pu-bearing solutions, 11: 12346

radioactivation analysis for, 11: 9589(R)

radioactive recoil from metallic surface, 11: 8541(R)

radiometric determination, 11: 10812(R)

radiometric determination in cylindrite, 11: 11936(J)

radiometric determination in rocks and minerals, 11: 11935(J)

separation of carrier-free, from Cd by adsorption and solvent extraction, 11: 12710(J)

solvent extraction from aqueous solutions, effects of concentration on, 11: 6686(J)

solvent extraction in HCl–bis 2-chloroethyl system, 11: 9186(R)

solvent partition of trace amounts during solvent extraction of Th, 11: 8289(R)

thermal neutron total cross sections, 11: 7826(R)

thermodynamic properties, 11: 11218

Indium alloys

metallographic investigations in relation to position in periodic system, 11: 1530(J)

microstructures, 11: 12753

Indium–antimony alloys

See Antimony–indium alloys.

Indium arsenides

electric properties, 11: 1174(J)

Indium–bismuth–cadmium alloys

See Bismuth–cadmium–indium alloys.

Indium–cadmium–silver alloys

See Cadmium–indium–silver alloys.

Indium foils

activation analysis, 11: 7843(R)

neutron detection by β particle emission in, 11: 3946

neutron flux measurements using, 11: 497(J), 5452(J)

Indium ions

polymerization in aqueous solutions, 11: 6686(J)

Indium isotopes

nuclear magnetic moments, 11: 550(R)

Indium isotopes In^{106}

disintegration properties, 11: 770

Indium isotopes In^{109}

radioactivity, 11: 3524

Indium isotopes In^{113}

conversion electron spectra, 11: 3608(J)

hyperfine structure anomalies, 11: 9454(J)

magnetic moments of In^{115} and, ratio, 11: 9453(J)

magnetic resonance, 11: 2026(R)

neutron total cross sections and resonance parameters, 11: 9078(J)

nuclear magnetic moments, 11: 10231(R)

octupole interaction, 11: 9455(J)

production from neutron-bombarded tin, 11: 9167(J)

production of In^{113m} from neutron bombarded tin, 11: 9377(J)

Indium isotopes In^{114}

preparation for use in tracer studies, 11: 10424

radiation dosage determinations, 11: 481

total conversion coefficient and K/L ratio of isomer, 11: 13484(J)

Indium isotopes In^{115}

conversion electron spectra, 11: 3608(J)

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

fluorescence yield of K shell, 11: 3030(J)

hyperfine structure anomalies, 11: 9454(J)

hyperfine structure of resonance lines, 11: 12208(J)

inelastic scattering of photons by, 11: 12927(J)

magnetic moments of In^{113} and, ratio, 11: 9453(J)

neutron total cross sections and resonance parameters, 11: 9078(J)

nuclear quadrupole resonance spectrum, 11: 9251(J)

octupole interaction, 11: 9455(J)

Indium isotopes In^{116}

half lives, 11: 7842(R)

nuclear spin, 11: 10770

radiation dosage determinations, 11: 481

Indium–silver alloys

self-diffusion, 11: 11194(R)

Indium sulfates

corrosive effects on Al and steel, 11: 13430(R)

neutron activation, 11: 9052(R)

reactor criticality effects, 11: 9052(R)

Indium–zirconium alloys

constitution diagrams, determination of, 11: 12055

metallurgy, 11: 8707(R)

thermodynamic properties, 11: 10563

5-Indolol, 3-(2-aminoethyl)-

effects on blood coagulation, 11: 2776

Induced radioactivity

in food exposed during atomic explosion, 11: 1752

from neutron-activated slabs and cylinders, 11: 6043(J)

Induction furnaces

(See also Furnaces; Heaters.)

design and operation for melting metals, 11: 303

design for production of Ti shaped castings, 11: 2923

internally water cooled micarta-tube-type vacuum, design, 11: 2530

for solid-phase bonding, 11: 1882(R)

testing, 11: 7407(R)

Induction heating

of aluminum alloys, 11: 6376

of metal vacuum furnace for melting of metals, 11: 303

Industrial atomic energy conferences

reports from, 11: 13225(J)

Industrial hygiene

tracer techniques for study of dust diffusion in mines, 11: 13318(J)

Infections

susceptibility following irradiation, 11: 18, 47, 852(J), 1393, 1724, 2782(J), 6617(J), 7909, 9967(J)

susceptibility of mice, 11: 5128

Infrared gas analyzers

design for HF analysis, 11: 2268

Infrared optical systems

bibliographies, 11: 6691

Infrared radiation

(See also Thermal radiation.)

bibliographies, 11: 6691, 11258

generation and detection techniques, 11: 3874(R)

Infrared spectrometers

design of variable thickness cell, 11: 151(J)

double-beam adaptation for use with a grating, 11: 6692(J)

Infrared spectroscopy

applications in analysis of corrosion films, 11: 10535

bibliographies, 11: 6691

research program at Oak Ridge National Laboratory, 11: 9895

sample preparation, 11: 12961(R)

techniques and apparatus for longwave, 11: 11486(J)

Insecticides

effectiveness, tracer studies, 11: 17(J)

Insects

control, applications of radioisotopes, 11: 17(J)

control by exposure to radiation, 11: 873(J), 6202(J), 6203(J)

effects of ionizing radiations on populations of Collembola, 11: 13245(J)

radioinduced sterility and deformities of ground-inhabiting beetles, 11: 5143(J)

Instrumentation

for Detroit Edison Aqueous Recovery Plant, 11: 7135

Instrumentation and control

conference on nuclear, 11: 13382(J)

Instrumentation conferences

proceedings of 1957 national nuclear, 11: 13382(J)

Instruments

(See also Electronic equipment; Meteorological instruments; Radiation detection instruments; Radiation detectors.)

adapter assembly system design, 11: 7241

Instruments (cont'd)

centrifugal governor, analysis of equations of motion for, 11: 2567

for chemical analysis, review, 11: 5786(J)

for cutting single metal crystals to exact orientation, 11: 4551(J)

descriptions of SPERT-1, 11: 9102

design and testing of portable isotopic x-ray units, 11: 210(J)

design for γ-absorption determination of steam-water ratios in heat exchangers, 11: 6783

design for measurement of gas bubbles in liquid, 11: 461(J)

design for measurement of space between parallel plates in a tube, 11: 12795

design of annular impactor for sampling air for radioactive contaminates, 11: 6435

design of displacement gage, 11: 8519(R)

design of electrode holder for use with the Hilger Steeloscope, 11: 463(J)

design of gold and metal evaporator and thin film gage, 11: 1475(R)

development for use in high-radiation fields, 11: 12973(R)

fifty-four channel recorder, modified, 11: 1221

for power reactor gas and steam circuits, 11: 7249(J)

for radioisotope studies, 11: 4576(J)

reliability as a design parameter, 11: 7248(J)

Insulin

amino acid content, gamma radiation effects on, 11: 5247(J)

assay using C^{14} respiratory patterns, 11: 4814(R)

dissociation in pyridine–water and acetic acid–water solutions, 11: 12642(R)

Interferometers

analysis of D_2O/H_2O by, 11: 1564

Fabry-Perot, design, 11: 5408, 6264(J), 7371(J)

Intermediate reactors

(See also Submarine Intermediate Reactor; KAPL Intermediate Power Breeder.)

criticality studies, 11: 682(J)

danger coefficient theory, 11: 2695

Doppler effect, 11: 682(J), 13160

multiplication constant, mathematical analysis of multigroup method for calculating, 11: 7829, 9096

neutron flux distribution, mathematical analysis, 11: 1654(J)

thermal neutron spectrum, calculations, 11: 8187(J)

xenon poisoning effects in, method for calculating, 11: 9871

Intermediate Scale Homogeneous Reactor

breeding blankets, feasibility of fluidized thorium oxide, 11: 13900

conversion ratio as function of blanket radius, 11: 8593

copper as internal recombination catalyst in, 11: 11757

core structure, fuel circulation system, fuel recovery, and gas disposal, 11: 8707(R)

core testing, 11: 1315

criticality calculations, 11: 13131

design and development, 11: 7771, 7789, 7857(R), 7858(R), 13982(R)

flow-sheets, components, criticality, and core-circulation calculations, 11: 12585(R)

gas production, calculation, 11: 8592

gas separators, design criteria for, 11: 7765, 7782, 8594

gas system for, pressure drops in, 11: 7781

Intermediate Scale Homogeneous Reactor (cont'd)

heat transfer agent in breeder blanket of, use of core solution, 11: 7776

physical properties of gas mixtures in, at high temperature and pressure, 11: 7784

poisoning, 11: 7779, 11609

reactivity, contribution of delayed neutrons, 11: 7772

Intermetallic compounds

bibliography on Li, Na, K, and Rb, 11: 1878

binary Be, Ca, and Mg, structure bibliography, 11: 4879

crystal structure, 11: 1784(J)

development of high-temperature, 11: 324

paramagnetic susceptibility and valency, 11: 4885(R)

Intermolecular forces

analysis from scattering of low velocity molecular beams in gases, 11: 539

Internal combustion engines

(See also Aircraft engines.)

deposits, design of radioactive deposit gage for measurement, 11: 3798(J)

tracer technique for study of fuel additive distribution in intake systems, 11: 9181(J)

Internal conversion

(See also Conversion electrons.)

coefficients for low-Z elements, corrections, 11: 3036(J)

coefficients of K-shell, tables, 11: 4653(J), 6511(J)

effect of finite nuclear size on, 11: 3042(J)

nuclear structure dependence in electric multipole transitions, 11: 11349

Internal friction

design of testing equipment, 11: 811

measurement, equipment for, 11: 10560(R)

measurement with low frequency torsion pendulum, 11: 5882

International Atomic Energy Agency

report on, 11: 13225(J)

International Conference on the Peaceful Uses of Atomic Energy, Geneva

proceedings on industrial applications of radioisotopes, 11: 210(J)

proceedings on nuclear chemistry and the effects of irradiation, 11: 168(J)

proceedings on production of nuclear materials, 11: 203(J)

proceedings on reactor technology and chemical processing, 11: 683(J)

Intestine

(See also Gastrointestinal tract.)

dietary factors in absorption processes of small, following irradiation of dogs, 11: 1397

effects of radiation sickness on, after trauma, 11: 5726(J)

isolated loops, effects of whole-body irradiation in experimental animals, 11: 5141(J)

radiosensitivity, 11: 13565(R)

Invertebrates

radiation effects from reactor effluent, 11: 8260

Iodic acid

crystal structure, 11: 9587(R)

quadrupole spectrum of I^{127} in, Zeeman effect on, 11: 4605(J)

Iodides

(See also iodides of specific elements and Ammonium iodides.)

Iodides (cont'd)

blood plasma, thyroid clearance, tracer study, 11: 13255(J)

decomposition, design of apparatus for, 11: 8020(J)

determination by indirect flame photometric method, 11: 2835(J)

Iodination

of CH_4 by activated I^{128}, 11: 1463

Iodine

adsorption by Ag from reactor solutions, 11: 7536(R), 13951(R)

absorption from thorium breeder reactor solutions, 11: 12545

chemical behavior at tracer concentrations, 11: 3325(R)

chemical reactions with hydrocarbons of neutron activated, 11: 10024(J)

chemical state in neutron-irradiated IO_4^-, 11: 4336(J)

coulometric titration with Ce, 11: 4305(J)

evaporation from paint and metallic surfaces, 11: 1591(J)

exchange reactions between CH_3I and HI, 11: 3329

exchange reactions between p-fluorobenzyl iodide and potassium iodide, 11: 76

gamma absorption cross sections, 11: 12287(J)

gamma reactions (γ,n), cross sections, 11: 12914(J)

isotopic exchange reactions, for removal from dissolvers, 11: 7967

metabolism and bone deposition, tracer study, 11: 3680(J)

metabolism by red algae, tracer study, 11: 4261

metabolism in pre-frozen thyroid slices, tracer study, 11: 900(J)

neutron activation cross sections, 11: 1980, 8571

neutron activation determination, 11: 8285(R)

neutron total cross sections and resonances in kev region, 11: 4047(J)

photoneutron yields, 11: 4130(J)

polarographic determination, 11: 8282(R)

radiation chemistry, 11: 1464

radioactivity and weight of fission product, formed in reactor fuel, 11: 5670

reaction of fission product, with butex, TBP, and kerosene, 11: 4357

reactions with hydrocarbons, radiation effects on, 11: 3743(J)

recovery from gaseous mixtures by sorption on Ag, 11: 11502(P)

recovery from Zr crystal bar wash water, 11: 2535

removal from dissolver off-gases by Ag reactors, 11: 1323

removal from homogeneous reactor fuel solutions, 11: 5024(R), 11637(R), 11638(R), 13646

removal from Homogeneous Reactor Test, design of bed for, 11: 12699

removal from reactor core solutions by scrubbing, 11: 7838(R)

removal from reactor solutions by column stripping, 11: 11636(R)

separation of fission product, from solvents, 11: 4357

solvent extraction, 11: 13197(R)

thyroid metabolism, effects of irradiation, 11: 4225

thyroidal accumulation and metabolism in turtles, tracer study, 11: 899(J)

thyroidal uptake in adult and embryonic chickens, effects of vitamin B_{12}, tracer study, 11: 2810(J)

thyroidal uptake in sheep fetuses, tracer study, 11: 3676(J)

volume and activity of, produced in homogeneous reactors, 11: 13890

volumetric determination in homogeneous reactor fuel solutions, 11: 11586(R)

Iodine compounds

decomposition of p-nitrophenethyltrimethylammonium iodide by hydrogen isotope effect, 11: 6644(J)

Iodine compounds (cont'd)

exchange reactions of C^{14} between CNI and $C^{14}N^-$, 11: 3685(J)

synthesis of ethylenediamineplatinum(II) and (IV) bromides and iodides, 11: 10044(J)

Iodine fluorides

chemical reaction of IF_5 with F_2, kinetics, 11: 6270(J)

crystal structure of IF_7 at −145°C, 11: 10456

formation of IF_7 by reaction of F_2 and IF_5, kinetics, 11: 6270(J)

Iodine isotopes

chemical properties, recoil energy effects on, 11: 1464

enrichment by (γ,n) reaction, 11: 3936(J)

separation by filtration from reactor plant air streams, 11: 11649

Iodine isotopes I^{124}

preparation and application in treatment of thyroid carcinoma, 11: 7079(J)

Iodine isotopes I^{125}

decay schemes, 11: 775(J)

Iodine isotopes I^{126}

beta spectra, analysis of complex, 11: 768

Iodine isotopes I^{127}

Coulomb excitation, 11: 573(J), 4067(J)

gamma reactions (γ,n), cross sections, 11: 4040(J)

hyperfine splitting in the metastable state, 11: 10256(J)

neutron activation cross sections, 11: 9752(R)

neutron total cross sections and resonance parameters, 11: 9078(J)

thermal neutron capture by, soft γ rays from, 11: 10757(J)

Iodine isotopes I^{128}

recoils from neutron capture in ethyl iodide, 11: 9752(R)

replacement of H in CH_4 by, 11: 1463

Iodine isotopes I^{129}

decay schemes, 11: 12339(R)

Iodine isotopes I^{131}

application in blood volume determinations, 11: 7926(J)

applications in diagnosis of malignant melanoma of the eye, 11: 7927(J)

blood clearance rate factors in cardiac disease, 11: 6627(J)

counting losses on paint and metal surfaces, 11: 1591(J)

decay schemes, 11: 7430(R), 11574(R), 12970(R)

effect on food chains, 11: 56(J)

effects of large doses on basal metabolism in rats, 11: 842(J)

effects of radiation from, on thyroid gland in rats, 11: 4788(J)

occurrence in natural and depleted U salts, 11: 12956(J)

permissible levels on grasslands, 11: 4247

preparation for medical purposes, 11: 3367(J)

production by irradiation of Te, 11: 4552, 5124(P), 5707(P)

radiometric determination in dissolver off-gas, 11: 10175

radiometric determination in vivo in pig thyroid gland, 11: 6471

removal from air stream, efficiency of filters, 11: 11038

removal from radiochemical processing plants by silver reactors, 11: 11975

sorption by plants, 11: 2240, 3321, 8257(R)

spin, 11: 8283(R)

therapeutic applications in thyroid diseases, 11: 3315(J), 5178(J)

thyroid ablation following administration to dogs, 11: 11845(J)

Iodine isotopes I^{131} (cont'd)

thyroid clearance, 11: 13255(J)

thyroid tumors following injection, 11: 6197, 6204(J)

thyroid uptake in diagnosis of thyroid diseases, 11: 72

tissue distribution, 11: 4227(R), 5181(J), 6216(J), 9963(J), 10426(J), 12148(J), 13565(R)

toxicology in animals of continuous low-level exposure, 11: 2242(R), 8257(R), 8261(R), 11556(R), 11851(J), 11877(R)

Iodine isotopes I^{132}

emanation from heated $BaSO_4$ containing Te^{132}, 11: 2838(J)

gamma emission, 11: 11586(R), 12970(R)

occurrence in natural and depleted U salts, 11: 12956(J)

preparation, small-scale, 11: 7252(J)

preparation and beta emission, 11: 3289(J)

Iodine isotopes I^{133}

occurrence in natural and depleted U salts, 11: 12956(J)

Iodine isotopes I^{134}

gamma energy and half life, 11: 7430(R)

occurrence in natural and depleted U salts, 11: 12956(J)

Iodine isotopes I^{135}

occurrence in natural and depleted U salts, 11: 12956(J)

Iodine isotopes I^{136}

delayed neutron emission, 11: 10231(R)

Ion beams

(See also beams identified by particles, e.g. Neutron beams and specific ion beams, e.g. Nitrogen ion beams.)

acceleration potential regulator circuit, 11: 5103(P)

compensation of volume charge in, theory, 11: 1193(J)

continuous scanning of, in electromagnetic separators, 11: 8077(J)

intensity determination, calorimeter for, 11: 9407(J)

intensity measurements for isotopic ratio measurements, 11: 2584

linear equations of motion, 11: 9145

measurement of ionization of atoms by, 11: 9044(J)

space charge in positive, compensation time, 11: 7295(J)

Ion complexes

formation and structure, 11: 956(J)

Ion exchange

(See also Adsorption; Electrodeionization; Ion exchange processes; Ion exchangers.)

adsorption of U, factors affecting, 11: 9627(R)

applications in research, analytical chemistry, and industry, 11: 7149(J)

applications to U extraction and purification, reactor water treatment, Zr purification, and waste disposal, 11: 6299(J)

dynamics, theory, 11: 8883(J)

equilibria and kinetics, 11: 5365(R), 7149(J)

hydrolytic and ion pair adsorption processes, 11: 3766

inter-diffusion of two charged particles, 11: 7975(J)

liquid-phase mass transfer coefficients of packed columns, 11: 1828(J)

mass transfer in, review, 11: 5373

in organic and biochemistry, book, 11: 11127(J)

reaction mechanism of the system Dowex-50, Ca, Na, 11: 7136

review, 11: 4374(J)

selectivity of, fundamental studies on, 11: 9587(R)

Ion exchange (cont'd)

selectivity on Dowex-50 of divalent ions, 11: 5276(J)

of uranyl sulfate solutions, high concentration effects and rate studies, 11: 7148(J)

Ion exchange materials

(See also Anion exchange materials.)

absorptive properties of Dowex resins, 11: 8286(R)

adsorption bands, application of high-frequency analysis to, 11: 997(J)

adsorption properties of synthetic magnetites, 11: 4264

anion exchange membranes, ion motion near polarized surface, 11: 3767

behavior of metals with ion-exchange resin-HCl system, 11: 2338

bibliography, 11: 10035

for determination of U in ores and solutions, 11: 4293(J)

efficiency of Dowex-50 with Na–Ca system, 11: 7136

electric conductivity, temperature effects on, 11: 999(J)

electrochemical utilization, 11: 11648

evaluation of silicate and phosphate for removal of Sr and Cs from wastes, 11: 10473(R)

fluidization and physical properties of Dowex-50, 11: 2328

inter-diffusion of two charged particles in zeolite, 11: 7975(J)

performance and radiation effects, 11: 8338(R)

preparation for resin-in-pulp devices, 11: 11595

radiation damage in, 11: 8284(R)

structure, properties, and mode of action, 11: 11981(J)

structure, synthesis, and properties, 11: 7149(J)

testing for adsorption of U, 11: 9626(R)

testing of demineralizer, 11: 1312(R)

theory, applications, techniques, and apparatus, review, 11: 5272(J)

titration of basic functional groups in, using $HClO_4-CH_3COOH$, 11: 5790(J)

transport number, determination of, 11: 1829(J)

Ion exchange processes

application to analytical chemistry, 11: 11124(J)

countercurrent, development and applications, 11: 189(J)

development for U isotope separation, 11: 12391

development for U recovery from reactor fuels, 11: 12391

engineering aspects in hydrometallurgy, 11: 2928(J)

equipment, evaluation of continuous, countercurrent, moving bed column, 11: 7137

for radioactive water purification, 11: 8251(P)

radiochemical separation and concentration by, 11: 8270

for separation of Am from rare earths, 11: 4844(J)

for separation of Pu from U and fission products, 11: 986

separation of Th and U from monazites by, 11: 13634

theory, applications, techniques, materials, and apparatus, review, 11: 5272(J)

uranium isotope separation by, 11: 7704

uranium ore processing by, 11: 7512

Ion exchangers

application to analytical chemistry, 11: 11124(J)

continuous and fixed bed, effect on concentration and deconcentration of U in Thorex Process, 11: 11628

design and operation of continuous or semi-continuous columns, 11: 2337

design and performance of, for Submarine Thermal Reactor, 11: 5029(R)

Ion exchangers (cont'd)

design and performance of resin-in-pulp devices for recovery of U and V, 11: 11595

design for ore processing, 11: 7507(R)

design for rare-earth separation, 11: 971(J)

design of remote, for decontaminating solutions, 11: 9540(P)

efficiency measurement of system Dowex-50, Ca, Na, 11: 7136

investigation of continuous, 11: 2328

mechanical characteristics, 11: 3353, 3754

performance of the Higgins continuous, and comparison with a conventional fixed-bed column, 11: 7452

performance of uranium and thorium columns in Thorex Process, 11: 12369

review, 11: 3353, 4374(J)

testing of continuous, countercurrent, moving bed column, 11: 7137

theory and characteristics, 11: 8270

Ion pair production

by beta particles in gases, absolute energy for, 11: 12764(J)

Ion pumps

design, 11: 13837(R)

design for easy construction and outgassing, 11: 10067(J)

design of radiofrequency, 11: 9571(P)

design of small Ti, 11: 13358(R)

ion density and energy distribution, 11: 13838(R)

Ion sources

bead fabrication for mass spectrometer, 11: 10630

design, for use with vacuum lock on mass spectrometer, 11: 12800

design for high density, monatomic controlled beam with no gas production between pulses, 11: 3254(P)

design for large current linear accelerator, 11: 7868

design for line recorder, 11: 3463

design for producing heavy ions with charge equal to atomic weight, 11: 9559(P)

design of generator for very high current beam, 11: 7038(P)

design of high-frequency, 11: 7244(J)

design which prevents gas from entering the analyzing chamber, 11: 11546(P)

design with controllable temperature, 11: 9561(P)

development at Oak Ridge National Laboratory, 11: 9888(R)

for ejecting plasmons, design, 11: 3453

graphite arc block for isotope separation apparatus, 11: 8253(P)

high current ion injector, development and use, 11: 3591(J)

mass analysis of high frequency, for Van de Graaff accelerator, 11: 12129(J)

polarized, for accelerators, 11: 13527

radio-frequency, improved design of, 11: 1360(J)

safety, in industrial applications, 11: 13371(J)

Ionics, Inc., Cambridge, Mass.

progress reports, 11: 177(R), 178(R), 2353(R), 2354(R), 5029(R)

progress reports on electrolytic separation, 11: 2581(R)

progress reports on resin studies, 11: 1312(R)

Ionization

cavity, theories, 11: 4759(J)

coefficient, theory of, 11: 1920(R)

cross sections of atoms, measurement, 11: 9044(J)

free radical formation in liquids induced by, 11: 4343(J)

Ionization (cont'd)

in ionic and atomic impact phenomena, 11: 4015

measurements at high energy in nuclear emulsions, 11: 492(J)

by x rays in air at atmospheric pressure, 11: 6960(J)

Ionization chambers

(See also Cloud-ion chambers.)

backscattering of β particles in gases of, 11: 11465(J)

boron coatings for, preparation, 11: 3966(J)

calibration, 11: 9765

calibration for neutron dosimetry, 11: 3479(R)

calibration of, in duct of BEPO, 11: 10176

construction and operation of spherical, for recording photoneutrons, 11: 4155(J)

design and calibration for detection of β particles, 11: 12156(J)

design and characteristics of, for reactor instrumentation, 11: 5460(J)

design and performance for assay of radioactive gases, 11: 3701

design and performance of pulse, as α spectrometers, 11: 8091(J)

design for detection of alpha particles, 11: 9373(J)

design for measurement of x-ray quanta, 11: 5448(J)

design for neutron flux measurement, 11: 11533(P)

design for spectrographic determination of transuranic elements, 11: 2831

design for surveying intense γ sources, 11: 3476

design of amplifiers for use with, 11: 6781

design of Ar-filled, battery operated, for background and emergency radiation detection, 11: 2603

design of Ar-filled, for gamma source calibration, 11: 5962

design of, for x-ray dosage measurements, 11: 10180(J)

design of B^{10}, for use in thermal reactor control systems, 11: 4943(J)

design of BF_3-filled, for power reactor control, 11: 7265

design of charge-transfer instrument for use with, in x-ray dosage measurements, 11: 4939(J)

design of delay-line that has large area, low capacitance, 11: 5453(J)

design of ionization cameras, application to the study of radioactive minerals, 11: 1248(J)

design of linear amplifiers for use with, 11: 12797(J)

design of temperature regulator for, 11: 9561(P)

design which minimizes maintenance and reduces dead time, 11: 9567(P)

development, 11: 10649

development of neutron sensitive, 11: 6824(J)

development of pocket, for estimating β dose, 11: 7264

efficiency, calculation of Rn, 11: 10811(R)

electron drift velocities in gases, 11: 4916(J)

electron pulse shape in cylindrical, 11: 6480(J)

in-pile tests of Submarine Thermal Reactor compensated, 11: 2548

materials of construction, 11: 2456

measurement of α-γ-angular correlations with, 11: 8090(J)

measurements of half lives of radioactive isotopes by differential, 11: 12141(J)

performance, influence of chamber material, 11: 7269(J)

performance for determination of plutonium hexafluoride, 11: 12811

performance for measurement of α energies, 11: 485

performance for pile neutron measurements, 11: 4571

performance for radiometric analysis of tritiated water samples, 11: 3952

Ionization chambers (cont'd)

performance in calibration of radiation sources, 11: 5440

performance in determinations of radioactivity of human body, 11: 9001(J)

performance in fission counter, 11: 3959

performance in measurements of γ radiation, correction for Bragg-Gray stopping power, 11: 5979(J)

performance in rate meters, 11: 2978

performance of cylindrical, for radon gas measurement, 11: 10177

performance of micro-, in Bomke dosimeter, 11: 10654(J)

performance of pulse, in measuring energy and angular distribution of charged particles, 11: 12816(J)

performance of six position gridded, for alpha energy measurements, 11: 9397

shielding for, heat removal from, 11: 8749

survey instrument using, design of wide-range, 11: 6827(J)

volt-ampere characteristic, effect of weak ionization and space charge, 11: 1998(J)

Ionization potentials

of inorganic crystalline compounds, 11: 2845(J), 2846(J)

Ions

(See also headings for ions by name, e.g., Uranium(IV) ions and Anions; Cations; Charged particles; Gaseous ions; Recoil ions.)

acceleration in 3-dee cyclotrons, modes, 11: 1361(J)

biological effectiveness of H, He, C, N, and O, 11: 52(R)

charge, dependence on density of surrounding medium, 11: 10793(J)

collection of, produced by α particles in air, 11: 5513(J)

collection of positive, by probe immersed in plasma, 11: 5396(J)

detection of positive, using semiconductors, 11: 9771(R)

detection with a scintillation detector in a mass spectroscope, 11: 2970(J)

diffusion of radioactive, in crystals, 11: 2938(J)

electron capture and loss phenomena, 11: 4015

fields on plasma, evaluation of probability, 11: 4529(J)

mass analysis method without heavy magnets, 11: 8254(P)

mobility and space charge of, in non-uniform field, 11: 424(J)

motion in omegatron, field distribution effect on, 11: 1572

multivalent, determination of primary and secondary adsorptions in radioelement co-precipitation with precipitation of slightly soluble salts, 11: 98(J)

nuclear Coulomb excitation by heavy, 11: 4061(J)

optimum charge distribution for computation by Bertaut's method, 11: 1461

pair production in air, energy measurements, 11: 2941(J)

photographic detection in mass spectroscopy, 11: 8236(J)

polarizability, measurement with field electron microscope, 11: 393(J)

positive, disintegration in collision with molecules, 11: 2201(J)

range-energy relations of $3 \leq Z \leq 10$, in Ilford C_2 nuclear emulsions, 11: 6556

reactions in aqueous solutions, kinetics, 11: 11922(J)

scattering of positive, by neutron atoms, 11: 9065(J)

stopping cross sections for, in gases, 11: 550(R)

trapping for operation of omegatron, 11: 1572

Iowa State College, Ames

progress reports on chemical research, 11: 8269(R)

progress reports on high temperature lubricants and related materials, 11: 11057(R)

Iowa State Coll., Ames (cont'd)

progress reports on metallurgy, 11: 13787(R)

progress reports on organo-metallic and -metalloidal high temperature lubricants, 11: 1765(R)

Iridium

anion exchange separation from Os_5, 11: 1002(J)

anomalous internal conversion ratios of E3 transitions, 11: 9447(J)

deposition of thin films, 11: 10560(R)

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

ion exchange recovery, 11: 10813(R)

neutron total cross sections and resonance parameters, 11: 9078(J)

sigma phases containing, 11: 11238(J)

Iridium compounds

spectra of Ir(III) pyridine complexes, 11: 6697(J)

Iridium fluorides

crystal structure of IrF_3, 11: 3711(J)

Iridium isotopes

half lives, 11: 3330(R)

Iridium isotopes Ir^{191}

internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

Iridium isotopes Ir^{192}

decay scheme, 11: 776(J), 3609(J), 6050(J)

gamma–gamma coincidence measurements in spectra, 11: 8087(J)

as gamma source for industrial radiography, 11: 10521(R)

gamma sources for radiography, calibration, 11: 11311(J)

neutron capture cross sections, 11: 5547(J), 9052(R)

production, 11: 10521(R)

spectra, conversion lives in β, 11: 12204(J)

Iridium isotopes Ir^{193}

internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

isomers, 11: 5547(J)

Iridium–platinum alloys

vacancy formation, energy of, 11: 11234(J)

Iridium–uranium alloys

quenching experiments, 11: 13042

Iron

(See also Cast iron; Martensites; Steel.)

activation determination in Al alloys, 11: 1776

angular distribution of 424-Mev protons elastically scattered from, 11: 10350(J)

augmented plane wave method for studying, 11: 6855(R)

as base metal for oxidation and liquid Na resistant brazing alloys, 11: 275(R)

blood plasma levels, effects of x irradiation in rats, 11: 11847(J)

boundaries and substructures, study by electron metallography, 11: 338(J)

chromatographic adsorption on Al_2O_3 from mixtures of $LiNO_3$–KNO_3, 11: 4377(J)

colorimetric determination by orthophenanthroline method, 11: 10815(R)

colorimetric determination in $ZnBr_2$, 11: 13267

combustion analysis for C, 11: 2258

Iron (cont'd)

complexing with malonate, prevention of Fe^{3+} co-precipitation with UO_4, 11: 6995(P)

concentration in blood plasma, effects of radiation in rabbits, 11: 2233(R)

concentration in rat erythrocytes, effects of γ radiation dose rate, 11: 5138

corrosion, bibliography on, 11: 11186

corrosion by fluorine gas at high temperatures, 11: 7184

corrosion by hot pressurized water, prevention, 11: 3248(P)

corrosion by Li, 11: 8745

corrosion by water, 11: 8911

corrosion by H_2O–H_2S, organic inhibitors for, 11: 5101(P)

corrosion by H_2O, H_2SO_4, and UO_2SO_4, effects of pertechnetate on, 11: 11676

corrosion in liquid Bi-base metals, 11: 8444

corrosion in tetralin, 11: 7848(R)

corrosion of Be affected by, 11: 7680

corrosion of films, use as corrosion indicator, 11: 5861

corrosion products, bibliography, 11: 3817(J)

coulometric and reductimetric determinations, 11: 8285(R)

coulometric determination with Ti, 11: 941(J)

cross section for cosmic protons and neutrons at 50 Bev, 11: 9357(J)

determination in homogeneous reactor solutions, 11: 4292(J)

determination of latent heats of $\alpha \rightarrow \beta$ transition in, 11: 1902(J)

diffusibility for C, 11: 3427(R)

diffusion in molten FeS, 11: 3441(R)

diffusion in Ag, isotope effect, 11: 11194(R)

effects of radiation on self-diffusion, 11: 13884(R)

electric conductivity and thermal properties, 11: 9325(R)

electrodeposition on Th, 11: 13783

electrodialysis, 11: 987

electrodiffusion of H in, retardation by surface coatings on, 11: 6422

Flade potential on, inhibited by ions of XO_4^{-n} type, 11: 11239(J)

gamma attenuation in, nomographs, 11: 3620(J)

gamma-induced heating, 11: 4675, 5614(J), 8687(J), 9894

gamma reactions, 11: 704(J), 760(J), 4115

high-temperature corrosion by NaOH, 11: 5312

inelastic scattering parameters, 11: 10916

influence of diffused H_2 of potential of, in NaOH solutions, 11: 5193(J)

ion exchange separation from Pa, 11: 8282(R)

ionization potential difference and variable valence, 11: 11071(J)

isothermal precipitation from Cu–Fe alloys in temperature range 550 to 800°C, 11: 1149(J)

K fluorescence yield, 11: 5545(J)

melting point, 11: 8517(R)

metabolism in health and disease, tracer study, 11: 902(J), 5136(R), 6630(J)

neutron absorption and shielding properties, 11: 8748

neutron activation determination, 11: 12973(R)

neutron attenuation, 11: 7847(R)

neutron cross sections, 11: 9777, 10229

neutron cross sections, multigroup, 11: 12284

neutron irradiation effects, 11: 1980, 2768, 4739

Iron (cont'd)

neutron leakage through pure, 11: 4007

neutron production from cosmic-ray interactions in, 11: 687(J)

neutron reactions, 11: 10554

neutron reactions (n,γ), 11: 13209

neutron reactions (n,p), 11: 5623(J), 9141(J)

neutron resonances, 11: 550(R)

neutron scattering at 2.5 and 7.0 Mev, 11: 3035(J)

neutron scattering at 4.4 Mev, 11: 6856

neutron scattering cross sections and neutron transmission, 11: 8562(R)

neutron streaming through, effects of impurities on, 11: 13884(R)

neutron transmission and scattering cross sections, 11: 11740(R)

passivation by OsO_4, 11: 1079(J), 1519

polarographic–amperometric determination, 11: 9234(J)

positron polarization demonstrated by annihilation in magnetized, 11: 10265(J)

precipitation from acid leach solutions, 11: 1488

production of recoil electrons by passage of mesons(μ) through, 11: 5937(J)

proton elastic scattering, 5.7 Mev, 11: 12202(J)

radiation effects, 11: 1167(J), 1922(R), 8745

radioactivity induced in, by reactor irradiation, 11: 13200

radioinduced heating from neutrons and γ rays, 11: 10923(R)

rate of solution and precipitation from bismuth, 11: 13885(R)

recrystallization at low temperatures, 11: 11236(J)

self-diffusion in molten Fe–C systems, 11: 1171(J)

self-diffusion into Fe–C and Fe–S liquid systems, 11: 3424(R)

self-diffusion studies, 11: 7710(R)

separation from Al by precipitation of $Fe(IO_3)_3$, 11: 2864(J)

separation from Am in HNO_3 solutions, 11: 4358

separation of U from, by ion exchange in nitrate media, 11: 11982(J)

separation of U from, complexing with KF and NH_4F, 11: 6315(J)

slowing-down area for fast neutrons, 11: 9430

solubility in Bi, 11: 2140(J), 9983(R)

solubility in liquid Bi, 11: 7691(R), 7734(R)

solubility in liquid Na, 11: 13564(R)

solubility in water and corrosion, 11: 276

solvent extraction, 11: 2356

solvent extraction from acid leach liquors, 11: 2357

solvent extraction from ferrous materials using acetylacetone, 11: 10442

solvent partition in acetylacetone, 11: 11123

spectrographic determination in B, 11: 13599(R)

spectrographic determination in Bi and Bi–U alloys, 11: 4283

spectrophotometric determination, 11: 119(J), 120(J)

spectrophotometric determination in alkali metal fluoride salts, 11: 11580

spectrophotometric determination in aqueous solutions, 11: 11575

spectrophotometric determination in reactor solutions, 11: 11586(R)

spectrophotometric determination in Ti, 11: 12973(R)

surface area of films, 11: 6363

tensile properties of rolled green strip, 11: 9749

thermal diffusivity and electrical resistivity, 11: 8117(R)

Iron (cont'd)

transition equilibria of, thermodynamic relationships to, 11: 1142(J)

uptake by plants, tracer study, 11: 7398(R)

for use in ionization chamber construction, radiation effects, 11: 2456

vacuum annealing, 11: 7691(R)

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

Iron alloys

corrosion, mechanical and high-temperature properties, welding, and structure, survey and bibliography of current literature, 11: 350(J)

corrosion by hot pressurized water, prevention, 11: 3248(P)

corrosion by Mg at 1150°C, 11: 9580(R)

corrosion of Globeiron by liquid NaK and Na, 11: 7727

development of heat- and scale-resistant, 11: 5890

development with creep-rupture strength at 1600 to 1800°F approaching Co base alloys H.S.21, 11: 5890

mass transfer by Li at high temperatures, 11: 4464(R)

neutron reactions (n,γ), 11: 13209

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

radiation effects, 11: 8747(R)

thermal and deformation effects on binary, with Cr, Ni, Mn, and W, 11: 1896(J)

transition equilibria of, thermodynamic relationships to, 11: 1142(J)

x-ray investigation of deformation and bond strength in crystal lattice, 11: 5328(J)

Iron–aluminum alloys
See Aluminum–iron alloys.

Iron–aluminum–chromium–molybdenum–titanium alloys
See Aluminum–chromium–iron–molybdenum–titanium alloys.

Iron–aluminum–chromium–titanium alloys
See Aluminum–chromium–iron–titanium alloys.

Iron–aluminum compacts
See Aluminum–iron compacts.

Iron–aluminum–molybdenum alloys
See Aluminum–iron–molybdenum alloys.

Iron–aluminum–titanium alloys
See Aluminum–iron–titanium alloys.

Iron–beryllium alloys
See Beryllium–iron alloys.

Iron, biscyclopentadienyl-

physical properties and preparation, 11: 11563(R)

Iron–boron–chromium–nickel systems
See Boron–chromium–iron–nickel systems.

Iron–carbon systems
See Carbon–iron systems.

Iron–carbon–titanium systems
See Carbon–iron–titanium systems.

Iron chlorides

antiferromagnetic structures of anhydrous, 11: 9189(R)

free energy of formation, 11: 86(J)

Iron(II) chlorides

neutron scattering, 11: 4016(R)

radiation-induced oxidation of Fe, 11: 5240(J)

Iron(III) chlorides

ion exchange separation, 11: 12970(R)

Iron–chromium alloys
See Chromium–iron alloys.

Iron–chromium–cobalt–nickel alloys
See Chromium–cobalt–iron–nickel alloys.

Iron–chromium–europium oxide–nickel systems
See Chromium–europium oxide–iron–nickel systems.

Iron–chromium–molybdenum alloys
See Chromium–iron–molybdenum alloys.

Iron–chromium–molybdenum–nickel alloys
See Chromium–iron–molybdenum–nickel alloys.

Iron–chromium–molybdenum–titanium alloys
See Chromium–iron–molybdenum–titanium alloys.

Iron–chromium–molybdenum–vanadium alloys
See Chromium–iron–molybdenum–vanadium alloys.

Iron–chromium–nickel coatings
See Chromium–iron–nickel coatings.

Iron–chromium–titanium alloys
See Chromium–iron–titanium alloys.

Iron–cobalt–nickel alloys
See Cobalt–iron–nickel alloys.

Iron complexes

with EDTA, charge transfer rates between Fe^{2+} and Fe^{3+}, 11: 916(J)

Iron compounds

absorption on orthophosphate and phosphonate polymers, 11: 4373

coprecipitation of ferric periodate with Al, Y, and Zn, 11: 2863(J)

properties of mannitoferric acid, 11: 11064(J)

spectrographic analysis for Cs, 11: 3340

Iron–copper alloys
See Copper–iron alloys.

Iron–copper–nickel alloy couples
See Copper–nickel alloy–iron couples.

Iron films

magnetic domain patterns on thin, 11: 7203(J)

Iron fluoride complexes

chemical properties, 11: 11493

Iron fluorides

crystal structure of FeF_3, 11: 3711(J)

nuclear magnetic resonance of F^{19} in, 11: 6881(J), 6882(J)

Iron(II) hydroxides

for decontamination of radioactive solutions by precipitation, 11: 3227(P)

Iron(III) hydroxides

absorptive properties for fission products, 11: 5277

effects of radiation on, 11: 8715(R)

Iron(II) ions

chemical stability in HNO_3 solutions, 11: 7525

oxidation rate in $(NH_4)_2SO_4$ solutions, 11: 106

Iron(III) ions

coulometric determination with UO_2^+ ion, 11: 1439

crystalline cubic field splitting parameter in an S state, 11: 5387(J)

polarographic determination of, in reactor fuel solutions, 11: 9599

sorption on resins from H_2SO_4 solutions, 11: 8284(R)

Iron isotopes

charge distribution by electron scattering from Fe^{58} and Ni^{58}, 11: 2159

deutron reactions, 11: 1542(R)

energy levels, 11: 8562(R)

formation during irradiation of stainless steel, 11: 10554

Iron isotopes (cont'd)

neutron inelastic scattering at 2.6 Mev, energy levels, 11: 10772

thermal neutron reactions (n,γ), 11: 711(J)

Iron isotopes Fe^{52}

decay schemes, 11: 10231(R)

Iron isotopes Fe^{53}

decay properties, 11: 626(J)

Iron isotopes Fe^{54}

bremsstrahlung reactions (γ,2n) and (γ,pn) at 70 Mev, comparative yields for, 11: 12910(J)

deuteron reactions (d,n), excitation function, 11: 12196(J)

gamma emission from interaction of 4.4-Mev neutrons, 11: 6856

gamma reactions (γ,n), cross sections, 11: 11450(J)

gamma reactions (γ,pn) and (γ,2n), relative yields, 11: 6108

neutron reactions at 14 Mev, energies of protons from, 11: 5626(J)

neutron reactions (d,α), excitation function, 11: 12196(J)

Iron isotopes Fe^{55}

diffusion in Ag, 11: 5903(J)

energy levels, 11: 4710(J)

excited states in the Mn^{55}(p,n) reaction, 11: 10231(R)

half life, 11: 1292(J)

preparation of radiation sources from, 11: 3933

Iron isotopes Fe^{56}

energy levels, 11: 6863(R), 12186(R)

excited states, 11: 4980(J), 11368(J)

gamma emission from interaction of 4.4-Mev neutrons, 11: 6856

gamma rays at 0.845 and 1.24 Mev from, directional correlation, 11: 6044(J)

inelastic neutron scattering cross sections, calculations, 11: 6856

neutron activation cross section, 11: 13868(R)

neutron reactions (n,p), cross sections, 11: 9140(J)

neutron reactions at 14 Mev, energies of protons from, 11: 5626(J)

Iron isotopes Fe^{57}

directional correlation of 123- and 14-kev γ lines in, 11: 4981(J)

gamma reactions (γ,p), 11: 6108

nuclear spin, 11: 10251(J)

Iron isotopes Fe^{58}

preparation by electromagnetic separation, 11: 12411

Iron isotopes Fe^{59}

applications in tracer studies of iron metabolism, 11: 839(J), 902(J), 3675, 6600(J)

determination in irradiated Materials Testing Reactor fuel elements, 11: 8296(R)

diffusion in Ag, 11: 5903(J)

preparation of high specific activity, 11: 12330(R)

Iron isotopes Fe^{60}

half life, 11: 7312(J)

Iron–manganese alloys

corrosion by liquid metals, 11: 11807(R)

Iron–molybdenum alloys

corrosion and metallography, 11: 7691(R)

Iron–molybdenum–nickel alloys

corrosion and transport in fused NaOH, 11: 13324(J)

Iron–nickel alloys
coefficient of expansion, 11: 7733(R)
corrosion, mechanical and high-temperature properties, welding, and structure, survey and bibliography of current literature, 11: 350(J)
corrosion of permalloy powder by H_2SO_4, 11: 11567(R)
diffusion coefficients, 11: 6402(J)
high temperature oxidation, 11: 6388
hydrogen absorption, 11: 9334(J)
magnetic susceptibility in liquid and solid states, 11: 9351(J)
oxidation at high temperatures, 11: 9337(J)
Iron–nickel alloys (liquid)
oxygen solubility in, 11: 353(J)
Iron–nickel–oxygen systems
constitution diagrams and microstructure, 11: 6388
Iron–nickel–titanium alloys
grain structure, effects of temperature and strain on, 11: 1153(J)
Iron ores
x-ray-fluorescence analysis for Fe, 11: 4824
Iron oxide–aluminum oxide systems
See Aluminum oxide–iron oxide systems.
Iron oxide films
reduction by atomic H, 11: 7936(J)
Iron oxides
(See also specific iron oxide systems and Magnetites.)
diffusion in Al_2O_3 at 1500°C, 11: 6714(J)
electrophoretic deposition, use of zein in, 11: 11572(R)
surface tension of, and mixtures with other oxides at 1300 to 1400°C, 11: 1069(J)
Iron powders
rolling, 11: 9749
Iron–silicon systems
corrosion resistance, mechanical properties, and metallurgy, 11: 13325(J)
dilatation studies and transformation temperatures, 11: 1164(J)
Iron–silicon–titanium systems
dilatation studies and transformation temperatures, 11: 1164(J)
Iron sulfamates
chemical stability in HNO_3 solutions, 11: 7525
semi-continuous production system, 11: 13621
Iron sulfates
radio-induced oxidation in H_3BO_3 and Li_2SO_4 solutions, 11: 13578(R)
Iron(II) sulfates
oxidation by high-energy electrons, influence of polarization effects, 11: 9249(J)
oxidation by tritium betas, 11: 7405(R)
oxidation by U^{235} fission recoils and H^3 betas, 11: 11564(R)
radiation chemistry, 11: 1801(J), 2847(J), 4692(R), 5805(J), 7406(R), 12960(R)
x-ray dosimetry with solutions of, 11: 4577(J)
Iron sulfides
for decontamination of radioactive solutions by precipitation, 11: 3227(P)
diffusion of Fe in molten, 11: 3441(R)
properties and structure, 11: 12466(R)
Iron–sulfur systems
self-diffusion of Fe in, 11: 3424(R)
Iron–thorium alloys
extrusion, 11: 12500
Iron–titanium alloys
phase studies, 11: 4468
phase studies at elevated temperatures, 11: 346(J)
Iron–uranium alloys
corrosion by Bi, 11: 7655(R)
formation in Experimental Breeder Reactor fuel tubes, 11: 11747(R)
formation of Fe–U compounds at Na-wetted surfaces of U and stainless steel, 11: 13870(R)
inclusions, metallography, 11: 13099
physical properties, 11: 8520(R)
production and uses, history, 11: 8887(J)
properties of interest for use as refractory fuels, 11: 812
solubility in Mg–Th eutectic alloys, 11: 11703(R)
Iron–water systems
neutron and γ attenuation in, calculated by integral network method, 11: 5677
neutron spectrum emerging from shield of, 11: 8748
reaction products at 26 and 300°C, 11: 276
shielding properties for γ-radiation, 11: 11824
Iron–zirconium alloys
corrosion tests at elevated temperatures, 11: 1870
creep and rupture behavior, 11: 1524
Irradiation facilities
survey, 11: 12087(J)
Irradiation techniques
(See also Radiation target cans; Radiobiology; Radiotherapy.)
canning method for special U irradiation, 11: 9607
device which employs delayed neutrons, 11: 7027(P)
ISHR
See Intermediate Scale Homogeneous Reactor.
Isomeric transition
nuclear deformation effects on, 11: 3531(J)
octupole, with odd A, 11: 3533(J), 11365(J)
Isomers
See under specific isotopes and organic compounds.
Isopropyl ether
(See also specific systems, e.g., Hydrochloric acid–isopropyl ether–water systems.)
solvent properties, 11: 10812(R)
solvent properties for U, 11: 7539(R)
Isopropyl ether–acetic acid–water systems
See Acetic acid–isopropyl ether–water systems.
Isotope effects
hydrogen, in organic and inorganic compounds, 11: 5365(R)
by passage of current in molten Li, 11: 6796(J)
in pseudo first-order irreversible reactions, calculation of experimental, 11: 7104(J)
in unimolecular gaseous reaction, effect of pressure, 11: 7095(J)
Isotope production reactors
See Production reactors.
Isotope separation methods
centrifugal, for U isotopes, 11: 8987(J)
centrifugal, theory of, 11: 7972(J)

Isotope separation methods (cont'd)

chemical, for Cl, H, B, and N isotopes, 11: 9664(R)

chemical exchange, application to uranium, 11: 1240v

concentration of D_2 by NH_3-H_2 exchange, design development of plant for, 11: 132

differential electrical migration, theory, 11: 8265(R)

distillation, for B^{10}, 11: 6453(J)

distillation for O_2 and B, 11: 11534(P)

electrolytic, effect of cathode metal on, of H isotopes, 11: 10158(J)

electrolytic, effect of O_2 and depolarizers on hydrogen, 11: 7254(J)

electromigration, for alkali metals, 11: 8989(J)

electromigration in aqueous solution, 11: 8988(J)

evaporation, cascade, 11: 13108

evaporation of water, slow, 11: 12128(J)

exchange reactions, 11: 12513(R)

exchange reactions of N^{15}, 11: 1229(R), 9214

fractionation of polymer for B separation, 11: 7461

molecular distillation, development report, 11: 7703(R)

optimum conditions for dual-temperature heavy water enrichment, 11: 6268(J)

photochemical, feasibility for U isotopes, 11: 11826

photochemical applied to Hg and Li, 11: 13844

separation factor for H isotopes in distillation from salt solutions in H_2O-D_2O, 11: 5226(J)

surface diffusion in porous media, 11: 5955(J)

thermal diffusion, B^{10} concentration by, 11: 7702

thermal diffusion, design considerations for column cascades, 11: 13843

thermal diffusion, distillation, and chemical exchange, theory, 11: 11593

thermal diffusion, evaluation of theory, 11: 7701

thermal diffusion plant for enrichment of He^3 from atmospheric He, 11: 10469

for wet precipitation of Ba^{140}, 11: 7705

Isotope separation methods conferences

electromagnetic separation conference at Harwell, September, 1955, 11: 1569(J)

Isotopes

(See also specific isotopes and Halogen isotopes; Radioisotopes; Rare earth isotopes; Stable isotopes; Tracer techniques.)

applications of stable and radioactive, in the national economy and science in the U.S.S.R., conference, 11: 11016(J)

beta-emitting, standardization with liquid scintillator, 11: 3211(J)

buildup of heavy, in U reactor fuel, 11: 4213

in industry and research, Soviet Union Conference on Applications of Isotopes, Moscow, Apr. 4-13, 1957, 11: 12126(J)

ion exchange in reactor cooling water, 11: 9479

neutron activation cross sections, graphs, 11: 10248(J)

nuclear properties, activation handbook, 11: 11360

production and analysis, 11: 6450(J)

production by neutron irradiation, mathematical relations governing, 11: 4554

purchasing guide index, 11: 8984(J)

reactor irradiation of, optimum thickness of U containers for, 11: 4486

recovery from cyclotron diffusion pump gases, 11: 7036(P)

reference sample program at the National Bureau of Standards, 11: 8001(J)

Isotopes (cont'd)

relative abundance, 11: 4926(J)

review of handling methods, instruments, isotope geology, and isotope effects, 11: 4555(J)

short-lived, device for supplying repeated amounts, 11: 6795(J)

spin selection rules, charge independence and the comparison of isobaric triplets, 11: 2036(J)

trilinear chart, 11: 4638(J)

use in Japan, administrative and legal problems, 11: 56(J)

uses in organic chemistry, 11: 6451(J)

yield in reactors at high temperature, 11: 2114

Isotopic dilution

See Isotopic equilibration.

Isotopic exchange

effect of solvent rate for $C_3H_7I + I^-$ at 1200 kg/cm^2 pressure, 11: 97(J)

for enzyme mechanisms, 11: 2817(J)

between metals and electrolytic solutions, 11: 5764

oxidation-reduction reactions involving electron transfer, theory, 11: 6649(J)

reactions involving H^2 and O^{18}, method for kinetic study, 11: 1568(J)

between semi-infinite solid and well-stirred solutions, equations for, 11: 1578(J)

separation factor for H_2 and D_2, 11: 136(J)

in simple reversible reactions, integrated rate equations, 11: 7097(J)

J

Jacob Lake Quadrangle (Ariz.)

photogeologic map, 11: 1111(J)

Japan

survey of the need of nuclear power in, 11: 4(J)

Japanese Atomic Energy Commission

activities of Japan Atomic Energy Research Inst., 11: 3266

JEEP Reactor

design and operation, 11: 591(J)

neutron and γ-ray spectra measurements with nuclear emulsions, 11: 11414

shutdown characteristics, 11: 12231

Jet engine fuels

(See also specific compounds used as fuels and Fluid propellants; Solid propellants.)

chemical and high-temperature properties, 11: 8826(R)

radiation and temperature effects on, 11: 11958(R)

radiation effects, 11: 8822, 12693(R)

radiation stability and temperature effects, 11: 11157(R)

thermal and radiation stability, 11: 6282(R)

Jet engines

See Ramjet engines; Turbojet engines.

Jet pumps

theory of steam, 11: 7171(J)

Jets

hydrodynamic characteristics of Purex off-gas, 11: 7162

mercury vapor, for stripping electrons from heavy ion beams, 11: 4906(J)

Johns Hopkins Univ., Baltimore
progress reports, 11: 2388(R)
Johnson Quadrangle (Ariz.–Utah)
photogeologic map, 11: 9318(J), 12044(J)
Joint Establishment for Nuclear Energy Research (Norway)
progress report on nuclear research, 11: 7906(R)
Joints
(See also Brazed joints; Pipe joints; Riveted joints; Welded joints.)
corrosion testing of brazed, for stainless steel plates, 11: 10987(R)
design of 3 directional vacuum sealed, 11: 3925(J)
Journal bearings
performance of tungsten carbide, operating in Na and NaK, 11: 2448

K

k
See Multiplication factor.
K-49
See Production reactors.
K-Capture
See Electron capture.
K particles
absorption by He nuclei, 11: 12833(J)
angular distribution in (γ,p) reactions, 11: 12817
annihilation mode of nucleon-antinucleon system into a K-anti-K pair, 11: 565(J)
asymmetries of angular distributions of, from pion-nucleon and nucleon-nucleon collisions, 11: 1615(J)
capture of negative, by bound and free protons in emulsions, 11: 10668(J)
cascade decay of heavy, 11: 10214(J)
charge-exchange scattering of neutral beams, as test of parity-doublet proposals, 11: 11340(J)
chirality, 11: 10218(J)
decay characteristics, 11: 1260(J), 5986(J), 8106(J), 9413(J), 10233(R), 10665(J), 10667(J), 11344(J), 12068(R), 12834(J), 13408(J)
elastic scattering from H, 11: 526(J)
emission of electron pair in decay of, 11: 10208(J)
evidence for heavy neutral, and its cascade decay, 11: 9033(J)
evidence for long-lived neutral, 11: 9031(J)
identity and parity of, from a strong reaction, 11: 12829(J)
inelastic scattering of K^+ mesons in nuclei, energy distribution, 11: 10338(J)
interaction field for pion-nucleon scattering, 11: 12821(J)
interactions, vertex corrections to pion-, 11: 10676(J)
interactions and decays in flight, 11: 4951
interactions and lifetimes, 11: 10196
interactions at rest and mass, 11: 5468(J)
interactions in hydrogen, 11: 9032(J), 12161
interactions of 190 kev, with H, C, Al, Cu, Ag, Pb, 11: 13396
interactions with Σ^- hyperons producing hyperfragments, 11: 11335
interactions with nuclei, effect of exclusion principle, 11: 9414(J)
low-energy interaction with nucleons, 11: 10340(J)
mass and decay characteristics of $K_{\mu 2}$ and, 11: 1259(J)
K particles (cont'd)
mass determination, 11: 521, 13397
measurements of lifetimes, 11: 12835(J)
method of studying, 11: 9411(J)
model of the strong couplings, 11: 10217(J)
negative τ' decay, 11: 8101(J)
nuclear interactions of long lived neutral, 11: 12169(J)
nuclear potential for, 11: 10380(J)
nuclear spin and charge symmetry, 11: 13403(J)
parent stars of positive, 11: 8953(J)
parity and symmetry theory, review, 11: 9427(J)
parity doubling, 11: 10680(J)
parity nonconservation in decay of, 11: 10210(J)
photoproduction from polyethylene, 11: 13406(J)
photoproduction in hydrogen, 11: 13405(J)
produced in nucleon-nucleon and pion-deuteron collisions, effect of Λ^0-nucleon interaction on, 11: 9419(J)
production and decay, cloud-chamber study, 11: 3002(J)
production in photon reactions (γ,K) from single nucleons, 11: 11336(J)
production in photon reactions in hydrogen near threshold, 11: 11337(J)
production of (K^0,$\bar{K}^0$) and (K^+,K^0) pairs of, 11: 10201(J)
production of Σ hyperons by negative, stopped in nuclear emulsions, 11: 10669(J)
range-energy and range-momentum curves, 11: 12281
scattering, 11: 1630(J)
scattering, contributions of the K–π interaction to K^+–N, 11: 13479(J)
scattering by nucleons, 11: 12818(J)
scattering by nuclei, according to optical model, 11: 6139(J)
scattering by nucleons, perturbation theory, 11: 6138(J)
scattering from protons and deuterons, 11: 5988(J)
scattering of positive, by protons, 11: 10674(J)
scattering theory, with change of intrinsic parity, 11: 6578
scheme of isotopic multiplicities, analysis, 11: 9428(J)
spin determination of, 11: 6844(J), 12836(J)
stars, charged Σ hyperons from negative, 11: 10670(J)
stars in emulsions of negative and neutral, 11: 10673(J)
theory, 11: 12167(J)
total cross sections for 190-Mev positively charged mesons in complex nuclei, 11: 9028
violation of charge independence in strong interactions, 11: 13400(J)
Kaolinites
separation from aluminum phosphate minerals, 11: 291(J)
Kaolins
pulp, sedimentation, effect of pH on, 11: 6237(R)
spectrographic analysis for Li by emission spectroscopy and flame photometry, 11: 13265
KAPL Intermediate Power Breeder
coolant flow during standby, 11: 13947
cooling of fast breeder rods, 11: 11786
cooling system, operation of the standby cooling mockup, 11: 7834
core structure for fast loading, 11: 13945
design and feasibility, 11: 12554
design development, summary, 11: 13158
design modifications in reactor top, 11: 13947

KAPL Intermediate Power Breeder (cont'd)

design of hold down device and thermocouple plate, 11: 11793

fuel rod design and analysis, 11: 8680

materials testing under irradiation, 11: 14029

multi-group calculations on the fast loading of, 11: 13945

neutron flux and reactivity calculations for fast loading, 11: 13945

neutron leakage, 11: 11790

KAPL Intermediate Power Breeder Critical Experiments

design and comparison of SAPL IV and V, 11: 13949

feasibility report, 11: 11784

multi-group calculations, 11: 7831, 7832, 13564(R)

KAPL Plutonium Power Breeder Reactor

design of chemical processing plant for oxide fuel elements, 11: 13005

fuel element assembly, 11: 12556

KAPL Thermal Test Reactor

design and development, 11: 13928

purpose, description, operation, and safety, 11: 12600

water gap peaking in pressure vessel, measurements, 11: 12894

Katanga Region (Belgian Congo)

age determination of minerals in, 11: 5318(J), 5319(J), 5320(J)

Kellex Corp., New York

progress reports, 11: 9626(R), 9627(R), 9676(R), 11629(R), 11630(R), 12376(R)

progress reports on analytical procedures for process solutions, 11: 7440(R)

progress reports on effluent concentration, 11: 8441(R)

progress report on gas and crib waste decontamination, 11: 8434(R)

progress reports on U ore processing, 11: 9628(R)

Kentucky. Univ., Lexington

progress reports on preferred orientation and kinetics of recrystallization in Ti, 11: 1140(R)

Kerosene

(See also specific kerosene systems, e.g., Butyl phosphate–kerosene systems.)

as coolant compared to transformer oil for canned rotor motor, 11: 2454

coolant properties for reactor shielding, 11: 8687(R)

flammability of Purex Process, 11: 3360

properties as refrigerant in Homogeneous Reactor Test secondary refrigeration system, 11: 3786

radiation effects, 11: 7130(R), 13682(R)

radiation effects, ultraviolet spectra, and purification, 11: 13628

reaction of fission product I_2 with, 11: 4357

separation from TBP using $FeCl_3$, 11: 3748

solvent properties for $Pu(NO_3)_4$, 11: 4384

water removal by hydroclone, 11: 7417(R)

Kerosene–butyl phosphate–methanol–water systems
See Butyl phosphate–kerosene–methanol–water systems.

Kerosene–butyl phosphate–nitric acid systems
See Butyl phosphate–kerosene–nitric acid systems.

Kerosene–butyl phosphate–nitric acid–thorium nitrate systems
See Butyl phosphate–kerosene–nitric acid–thorium nitrate systems.

Kerosene–butyl phosphate systems
See Butyl phosphate–kerosene systems.

Kerosene–butyl phosphate–thorium nitrate–water systems
See Butyl phosphate–kerosene–thorium nitrate–water systems.

Kerosene–butyl phosphate–uranium nitrate systems
See Butyl phosphate–kerosene–uranium nitrate systems.

Ketols

rearrangement of triaryl-, 11: 11576(R)

Ketones

(See also Diketones.)

copolymerization with butadienes, 11: 2844(R)

radiation chemistry, 11: 960(J)

KEWB
See Reactor safety experiments.

Kidneys

bilateral function tests using I^{131}-labeled Urokon, 11: 7398(R)

catalase levels, effects on radiosensitivity of rats, 11: 54(J)

diuresis following whole-body irradiation of rats, 11: 8767(J)

function, effects of direct irradiation, 11: 6194(J)

function tests, 11: 830(R), 13566(R)

function tests, employing radioactive Diodrast and external gamma-ray scintillation counting methods, 11: 9576(R)

function tests, tracer techniques, 11: 1725(R), 7695(R), 10803(R)

radiosensitivity of alkaline phosphatase activity, 11: 8788(J)

King Mountain Area (Texas)

uranium occurrence and geology, 11: 1087(J)

Knolls Atomic Power Lab., Schenectady, N. Y.

environs monitoring, 11: 4248(R), 5731(R), 8837, 10804, 12651(R)

meteorology programs at West Milton and Knolls Sites, 11: 12839(J)

progress reports, 11: 9772(R), 12555(R), 13564(R)

progress reports in physics, 11: 9771(R), 11728(R), 13834(R)

progress reports on health and safety, 11: 2243(R), 2553(R), 4248(R), 5731(R), 6209(R), 7400(R), 8790(R), 12651(R)

progress reports on nuclear physics, 11: 12504(R)

progress reports on radiological development, 11: 7920(R), 8791(R), 8792(R), 8793(R), 9752(R)

progress reports on reactor engineering, 11: 2481(R), 7328(R), 11785(R), 13149(R)

progress reports on reactor materials, 11: 7678(R), 8679(R)

progress reports on Redox development, 11: 8380(R)

progress reports on waste disposal, 11: 7593(R)

Knothole Operation
See Upshot-Knothole Operation.

KPPB Reactor
See KAPL Plutonium Power Breeder Reactor.

Krypton

activation determination in Ag, 11: 4464(R)

adsorption on graphite, 11: 7959(J)

diffusion in Ag, radiometric analysis, 11: 10114(J)

diffusion in U, 11: 10585

diffusion in U–Al alloys, 11: 13088

diffusion of fission, from U metal, effect of thermal cycling, 11: 1218(J)

formation in fission, pressure buildup by, 11: 8664

L-series emission spectra, 11: 9176(J)

lattice constants, 11: 10133(J)

production and application, industrial methods, 11: 11263(J)

Krypton (cont'd)

radiometric analysis, 11: 10114(J)

solubility in homogeneous reactor fuel solutions and water, 11: 12898(R)

sparking potential at low pressures, 11: 7231(J)

thermal conductivity of Ne–Kr and Ar–Kr mixtures, 11: 6778(J)

volume and activity of, produced in homogeneous reactors, 11: 13890

Krypton ions

electron capture and ionization in collision of singly charged, with atoms of rare gases, 11: 3200(J)

Krypton isotopes

yield in fast neutron fission of Th^{232}, 11: 11268(J)

Krypton isotopes Kr^{78}

deuteron reactions (d,p), 11: 706(J)

Krypton isotopes Kr^{79}

energy levels and mass, 11: 706(J)

Krypton isotopes Kr^{80}

deuteron reactions (d,p), 11: 706(J)

Krypton isotopes Kr^{81}

energy levels and mass, 11: 706(J)

formation, decay, and half lives, 11: 9752(R)

Krypton isotopes Kr^{85}

beta decay, ionization following, 11: 12938(J)

gamma spectra, 11: 10114(J)

geochemical prospecting for underground uranium by content of, in natural waters, 11: 8939(J)

half lives, 11: 9587(R)

preparation, purification, and industrial uses, 11: 5403

as source for industrial thickness gage, 11: 5375(J)

spectra, 11: 8283(R)

L

L-Capture
See Electron capture.

Laboratories

(See also Caves.)

design and construction for handling radioactive materials, report lists, 11: 4325

design for gamma radiochemical studies, 11: 3738(J)

design for handling radioactivity, 11: 6275, 7678(R)

design for multicurie chemical process research, 11: 3354

design of Brookhaven National Laboratory, 11: 2633(R)

design of hot, for remote metallography, 11: 4837

design of radioisotopes building, 11: 12330(R)

manual for Arco Chemical Plant analytical control, 11: 8856

radiation control measures at Savannah River Plant, 11: 4326

radiological, bibliographies on design, 11: 7067

shield designs for Saclay hot, 11: 792(J)

Laboratory equipment

description, for high activity levels, 11: 9607

description of Dounreay, 11: 11043(J)

design and construction for handling radioactive materials, report lists, 11: 4325

Laboratory equipment (cont'd)

design for liquid-liquid extraction of radioactive material, 11: 8866

design of low-pressure combustion determination apparatus, 11: 2258

design of two roller anti-friction latch, 11: 6993(P)

for determination of transuranic elements, 11: 2831

for fluorination of irradiated U and Th systems under glovebox conditions, 11: 3355(J)

reaction bomb for use at elevated temperatures and pressures, 11: 6667(J)

testing of gloves for protective enclosures, 11: 10409

Laguna Area (N. Mex.)

preliminary geologic map of, 11: 12041(J), 12042(J)

stratigraphy of Morrison formation in, 11: 2910(J)

Laminates

beryllium and graphite, brazing together of, 11: 8517(R)

damping capacity, elastic properties, and fatigue at room temperature, 11: 5345(R)

high-temperature properties, 11: 11256

Laminates (clad)

properties for etched printed circuit boards, 11: 13360

Lance Creek Area (Wyo.)

exploration, geology, and mineralogy, 11: 12734

Lanthanum

atomic spectra, 11: 4751(J)

carrying by $BiPO_4$ precipitation, 11: 7460

for concentration of Pu by carrier precipitation, 11: 5091(P)

coprecipitation with bismuth phosphate, 11: 12370

distribution in fused salts, 11: 9983(R)

electric conductivity and phase studies as a function of temperature, 11: 10359(J)

gamma spectra, 11: 11739(R)

magnetic susceptibility from 1.5 to 300°K, 11: 9171(J)

neutron-activation determination in Amex solutions, 11: 11586(R)

neutron total cross sections and resonances in kev region, 11: 4047(J)

physical and chemical properties, 11: 5816(J)

preparation from LaF_3 by bomb reduction, 11: 7673(R)

removal from radioactive waste solutions, 11: 1026

separation from Am by ion exchange, 11: 8398, 9259(J)

solvent extraction, 11: 13633(R)

solvent partition between hexone and HNO_3–$Ca(NO_3)_2$ solutions, 11: 6685(J)

spectrographic determination in Mg, 11: 3705(J)

superconductivity, 11: 8117(R)

surface properties and interfacial reactions with refractory oxides, 11: 2851

surface tension and chemical reactions with refractory materials, 11: 2420(R)

vacuum fusion analysis for O_2 and N_2, 11: 3706(J)

Lanthanum alloys

superconductivity, 11: 8117(R)

Lanthanum–carbon systems
See Carbon–lanthanum systems.

Lanthanum–cerium alloys
See Cerium–lanthanum alloys.

specific heats and magnetic susceptibilities at low temperatures, 11: 9170(J)

Lanthanum chlorides

color centers and luminescence in single crystals containing Eu, 11: 2852(J)

spectral analysis by method of admixture with YCl_3, 11: 13300(J)

Lanthanum complexes

with thiourea, 11: 10031(J)

Lanthanum Fluoride Process

description, 11: 7009(P)

extraction and decontamination of Pu in, 11: 11620(R)

interference of Al^{3+}, use of $Zr(NO_3)_4$ for LaF_3 dissolution, 11: 13024(R)

manual of construction materials, 11: 8440

materials of construction, irradiation and corrosion testing, 11: 8440

metal solution, manuals for, 11: 7566

Lanthanum fluorides

adsorptive properties for Ba, Te, and Zr, 11: 7520

crystallographic data, 11: 6431(J)

precipitation from aqueous solutions, 11: 3350(J)

preparation from La_2O_3, 11: 7673(R)

Lanthanum ions

complexing by fluoride ions in aqueous solution, 11: 11113(J), 11966(J)

self-diffusion in polysterenesulfonated solutions, 11: 9587(R)

Lanthanum isotopes La^{137}

decay properties, 11: 11576(R)

Lanthanum isotopes La^{138}

decay properties, 11: 5071(J)

Lanthanum isotopes La^{139}

quadrupole moments, 11: 4646(J)

Lanthanum isotopes La^{140}

production of 100 curie amount, 11: 11733(R)

separation from Ba^{140}, 11: 2866(J)

toxicology, 11: 893

Lanthanum isotopes La^{141}

yield in thermal neutron fission of U^{235}, 11: 12254(J)

Lanthanum oxalates

thermal decomposition, 11: 972(J), 9589(R)

Lanthanum oxysulfides

preparation and physical properties of monocrystalline, 11: 9168(J)

Lanthanum sulfates

solubility, 11: 12584(R)

solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)

Laundries

equipment and operation, for washing protective clothing, 11: 12649

operation for decontamination of uranium-contaminated clothing, 11: 12650

Leaching

(See also Uranium leach solutions.)

effects of temperature and pressure on, 11: 12707

equipment for rotary, 11: 7145(R)

thermodynamic and kinetic factors influencing, 11: 4277(J)

of uranium from ores, concentrates, residues, and products, 11: 13015

of uranium ores, carbonate, use of O_2 and CO_2 for better oxidation, 11: 11497(P)

Lead

absolute pair production cross section, 11: 1251(J), 12760(J)

absorption and luminescence of fluoride solutions in, 11: 148(J)

Lead (cont'd)

activation analysis for Na, 11: 5778

aging characteristics by acid leaching experiments, interpretation, 11: 8001(J)

age measurements, 11: 5374(J)

alloying effect on fatigue properties of steels, 11: 320

anion-exchange separation from Bi^{207}, 11: 1002(J)

antiproton cross sections, 11: 10710(J)

antiproton interactions with nuclei, 11: 11362

centrifugal casting, 11: 8505

cooling properties for fast reactors, 11: 8682

corrosion by B compounds in H_2O, 11: 13889

corrosion products on, bibliography, 11: 12031(J)

corrosion by tropical environments, 11: 10538

corrosion studies of heat-transfer media, 11: 13516(J)

cosmic-ray interactions in, 11: 687(J), 1547(J), 1939(J), 5383(J), 6494(R)

creep, engineering applications of absolute rate theory to, 11: 315

cross sections, 11: 13197(R)

deposition and polarographic investigation, 11: 1435(J)

deuteron inelastic scattering cross sections at 190 Mev, 11: 8735(R)

diffusion in lead tellurides, 11: 11233(J)

electrodeposition on Th, 11: 13783

electron energy losses in, and its compounds, 11: 745(J)

extraction from Ra cake with NaCl solution, 11: 12328(R)

fluorescence yield, 11: 4648(J)

gamma absorption cross sections, 11: 12287(J)

gamma attenuation, 11: 10365

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gamma reactions, 11: 704(J), 760(J), 2161, 2162, 3186(J), 3620(J), 4115, 4675, 5614(J)

gamma reactions (γ,n), 11: 6865(R)

half-thickness values of gamma rays in, 11: 7091(R)

ion exchange behavior on Dowex-50, 11: 5276(J)

ion exchange from nitrate solutions, 11: 9587(R)

isolation and isotopic determination in meteorites and rocks, 11: 8001(J)

large angle pair production in, 11: 11266(J)

meson (π^-) interactions at 140 to 400 Mev, total cross section for, 11: 12830(J)

meson (π^+) production by 340-Mev protons by, 11: 5989(J)

meson reactions (μ,n) at sea level, 11: 3890

mobility in molten $LiCl-PbCl_2$ mixtures, conversion measurement for determination of, 11: 7253(J)

neutron, proton, deuteron, He^3, and α scattering cross sections, 11: 10996(R)

neutron absorption and radioactivity induced in, 11: 8695

neutron and proton distributions in, 11: 1652(J)

neutron attenuation theory, 11: 2768

neutron cross sections, 11: 9777

neutron cross sections, multigroup, 11: 12284

neutron elastic scattering cross sections at 14 Mev, 11: 6863(R)

neutron elastic scattering in, 11: 1642, 2174(J), 3593(J), 5491(J)

neutron emission following μ-meson capture, 11: 9138

neutron inelastic scattering cross section of natural, 11: 13884(R)

neutron reactions (n,γ), 11: 13209

Lead (cont'd)

neutron reactions (n,n'), excitation of isomeric states, 11: 9189(R)

neutron scattering cross sections at 14-Mev, 11: 10231(R)

neutron total cross sections, 11: 10229

neutron yields from deuteron reactions, 11: 8726

nuclear size studied by cosmic-ray interactions, 11: 6058(J)

pair production cross sections at 2.5 Bev, 11: 11378(J)

pion collisions with nuclei of, inelasticity in, 11: 1677

poloragraphic determination in micro volumes, 11: 7430(R)

polarographic determination in Pu-bearing solutions, 11: 12346

polarographic determination of, on stainless steel tubing surfaces, 11: 9230

production of recoil electrons by passage of mesons(μ) through, 11: 5937(J)

proton reactions, 11: 612(J), 1278(R), 4706, 5555(J), 6493

radioactivity induced in, by reactor irradiation, 11: 13200

scattering of high-energy μ mesons by, 11: 9039(J)

shielding thickness, calculations, 11: 2758, 6161

solder, effect of low temperatures on, 11: 2523

solubility in PbI_2, 11: 9217(J)

solvent partition in acetylacetone, 11: 11123

spectrum of inelastically scattered neutrons from, 11: 10910

tensile properties and creep-failure rate, 11: 10552

thermodynamic properties, 11: 11218

for use in ionization chamber construction, radiation effects, 11: 2456

wear resistance, for water-cooled reactor applications, 11: 12028

Lead (liquid)

corrosion of Croloy in, 11: 7734(R)

intersolubility with Ti powders at temperatures of 500 to 800°C, 11: 356(J)

neutron- and x-ray-diffraction patterns of, and atomic distribution, 11: 2620

solubility of Cu in, 11: 3866(J)

Lead alloys

corrosion products on, bibliography, 11: 12031(J)

creep, engineering applications of absolute rate theory to, 11: 315

Lead–antimony alloys
See Antimony–lead alloys.

Lead–bismuth alloys (liquid)
See Bismuth–lead alloys (liquid).

Lead–bismuth–thorium alloys
See Bismuth–lead–thorium alloys.

Lead–bismuth–tin alloys (liquid)
See Bismuth–lead–tin alloys (liquid).

Lead–bismuth–uranium alloys
See Bismuth–lead–uranium alloys.

Lead chlorides

dissolution in fused KCl, polarographic behavior, 11: 1435(J)

Lead complexes

with acetylacetone, solvent extraction behavior, effects of EDTA on, 11: 3763(J)

with nitrosonaphthol, formation constants, 11: 4301(J)

Lead crystals

elastic constants, 11: 7676(R)

Lead fluoride crystals

absorber for total absorption spectrometer, 11: 9004(J)

Lead glass

characteristics of British-made, 11: 11269(J)

production technology in the nuclear field in Britain, 11: 11270(J)

Lead isotopes

abundance in meteorites, 11: 4508(J)

abundance in minerals, variations in, 11: 8001(J)

abundances, interpretation of, 11: 8001(J)

anomalous internal conversion ratios of E3 transitions, 11: 9447(J)

composition and continuous differentiation of the crust of the earth from the mantle, 11: 10627(J)

decay schemes, 11: 627(J)

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

interferometric determination Pb^{204}, Pb^{206}, Pb^{207}, and Pb^{208}, 11: 6264(J)

proton inelastic scattering and (p,d) reactions, energy distributions, 11: 9495(J)

proton reactions (p,xn), cross sections, 11: 688(J), 689(J)

thermal neutron cross sections, review, 11: 10245

Lead isotopes Pb^{186}

production and decay properties, 11: 5949(J)

Lead isotopes Pb^{188}

production and decay properties, 11: 5949(J)

Lead isotopes Pb^{197}

production and decay properties, 11: 5949(J)

Lead isotopes Pb^{198}

production and decay properties, 11: 5949(J)

Lead isotopes Pb^{199}

isomeric transitions, 11: 3525(J)

production and decay properties, 11: 5949(J)

Lead isotopes Pb^{200}

decay properties studied by coincidence spectrometers, 11: 491(J)

Lead isotopes Pb^{201}

isomeric transitions, 11: 3525(J)

Lead isotopes Pb^{202}

energy levels of 3.62-h Pb^{202m}, 11: 9515(J)

gamma cascades in decay of, directional correlation measurements, 11: 3061(J)

half lives of isomeric states, 11: 9509(J)

Lead isotopes Pb^{203}

decay, gamma-gamma angular correlation in, 11: 9165(J)

half lives of isomeric states, 11: 9509(J)

isomeric transitions, 11: 3525(J)

Lead isotopes Pb^{205}

decay properties studied by coincidence spectrometers, 11: 491(J)

energy levels in, 11: 2068(J), 2069(J)

Lead isotopes Pb^{206}

energy levels, 11: 6877(J), 10700(J)

half lives of isomeric states, 11: 9509(J)

Lead isotopes Pb^{207}

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

Lead isotopes Pb^{208}

internal conversion at 2615 kev, 11: 3606(J)

isomeric states, decay scheme, 11: 8119(J)

neutron activation cross section, 11: 13868(R)

Lead isotopes Pb^{209}
decay schemes, 11: 7455(R)
Lead isotopes Pb^{210}
beta disintegration, 11: 3059(J)
decay, absolute intensities of L x rays and gamma ray, 11: 6967(J)
gamma spectrum, weak lines in, 11: 8224(J)
radiations from, studied by Ilford E_1 emulsions, 11: 4172(J)
radiochemical determination, 11: 13551(J)
transmutation to Po^{210}, gamma rays from, 11: 10629(J)
Lead isotopes Pb^{212}
decay schemes, 11: 11373(J)
preparation of radiochemically pure, extraction method for, 11: 199(J)
Lead isotopes Pb^{214}
energy levels, β-transition between Be^{214} and, 11: 625(J)
Lead–magnesium crystals
resistivity, 11: 4632(R)
Lead oxalates
pyrolysis, isotope effects and product composition, 11: 6643(J)
Lead oxide films
reduction by atomic H, 11: 7936(J)
Lead oxides
crystal structure, radiation effects on, 11: 11574(R)
thermal expansion and diffraction studies, 11: 413
Lead–oxygen systems
crystallography, 11: 413
Lead sulfates
basic, preparation and x-ray examination, 11: 3739(J)
solubility in TBP–kerosene–U nitrate systems, 11: 10808
thermoluminescence, 11: 7220(J)
Lead sulfides
Hall effect as function of temperature and of incident light, 11: 1920(R)
standard free energy of formation, 11: 6236
Lead tellurides
diffusion of lead in, 11: 11233(J)
Lead–thorium alloys
preparation and properties, 11: 13083(R)
Lead–tin alloys
life expectancy of solder plugs of, 11: 8689(R)
phase studies and effects of low temperatures, 11: 6733
Lead–tin alloys (liquid)
velocity of sound measurements in, 11: 1181
Lead titanate–barium titanate systems
See Barium titanate–lead titanate systems.
Lead titanates
piezoelectric coefficient, temperature effects, 11: 12071
Lead–uranium alloy slurries
properties and effect of thermal gradients on, 11: 1854(J)
Lead–uranium alloys
composition and structure, 11: 13804(R)
constitution diagrams, crystal structure, and neutron-diffraction pattern for, 11: 8931(J)
machinability, 11: 7659(R)
Lead–uranium alloys (liquid)
metallurgy, 11: 7732(R)
static corrosion of metals by, 11: 9747
Lead zirconates
piezoelectric coefficient, temperature effects, 11: 12071
x-ray- and neutron-diffraction study of structure, 11: 5388(J)
Leak detectors
design for canned fuel slugs, using He pressure, 11: 5114(P)
design for heat exchangers, 11: 3255(P)
design for Homogeneous Reactor Test fuel processing plant, 11: 2296
design for liquid Na, 11: 7847(R)
design for special flanges of the Homogeneous Reactor Test, 11: 9470
design for use in liquid Na heat exchanger, 11: 6585(P)
design of oxygen, 11: 4324
design using r-f mass spectrometer, 11: 468(J)
performance of, in testing pressure vessels and gaskets, 11: 2541
stress-corrosion cracking of Homogeneous Reactor Test, 11: 4678
Leaks
(See also Valves.)
capillary gas, 11: 3923(J)
detection by He method, 11: 4485
detection in double-walled heat exchangers, 11: 6320
testing for, in pipes, tubes, and finished equipment, 11: 5845
Leather
physical properties, effects of radiation on, 11: 12691
Leaves
sorption of I^{131}, 11: 3321
Lectures
on health physics, 11: 7921
on nuclear power development, 11: 8635
on reactor shielding, 11: 2710
Leeds and Northrup Co., Philadelphia
progress reports, 11: 4933(R)
Lees Ferry Quadrangle (Ariz.)
photogeologic map, 11: 1106(J), 5868(J), 6731(J)
Lemitar–Ladron Area (N. Mex.)
geophysical exploration, 11: 11191
LEO
cooling, effect of calandria on, 11: 4689
Leptons
charge, conservation of, 11: 12085(J)
classification of, 11: 13441(J)
interactions, weak, 11: 13472(J)
isocovariance properties, 11: 4964(J)
isospin and strangeness, 11: 13480(J)
nonconservation of charge and parity, 11: 12191(J)
primarity of weak interactions comprising, 11: 10665(J)
quantum numbers for, processes, 11: 13440(J)
weak interactions with bosons, 11: 3519(J)
Leucine
labeled with C^{14}, respiratory carbon patterns in rat tissues, 11: 4814(R)
Leukemia
biochemical blood changes associated with, in mice, 11: 1725(R)

Leukemia (cont'd)

induction following injection of cell-free extract in mice, 11: 10803(R)

radioinduced, 11: 7064(J)

radioinduced, following x-ray therapy, 11: 9946(J)

radiosensitivity of blood cells in, 11: 4794(J)

radiotherapy, a review of forty-eight cases treated with P^{32}, 11: 4801(J)

susceptibility to transplantation, effects of irradiation in mice, 11: 866(J), 867(J)

therapy of chronic, with urethane, embekhin, P^{32}, and x irradiation, comparative studies, 11: 8808(J)

x radiation therapy and transfusion of erythrocyte suspensions in chronic, 11: 8807(J)

Leukocytes

bactericidal activity of extracts, 11: 1720

concentration of undamaged, by centrifugation, 11: 10392

distribution of mast cells in rat bone marrow, effects of injected Au^{198}, 11: 7062(J)

effects of whole-body x-ray exposure on, in pollen-sensitized rats, 11: 11871(J)

glycogen content of surviving, effect of x-rays on, 11: 9200(J)

life spans in normal, irradiated, and leukemia mice, tracer study, 11: 5136(R)

in peritoneal fluid, effects of injection of antigen and whole-body irradiation in mice, 11: 6201(J)

physiology, 11: 13565(R)

radioinduced count changes and motility of, in rabbits, 11: 853(J)

radiosensitivity effects of injected, in rabbits, 11: 12961(R)

radiosensitivity in man, 11: 56(J), 5136(R), 9936(J)

of thymus, radiosensitivity to high doses of x radiation, 11: 11870(J)

transfusions of, therapeutic effects in radiation sickness, 11: 2801(J)

Leukopenia

artificially induced in dogs, 11: 826

radioinduced, 11: 3304(J), 3313(J)

Level indicators

calibration of Homogeneous Reactor Test chemical process receiver tank, 11: 9760

design for homogeneous reactors, 11: 10292

design for liquid-metal measurement in enclosed tanks, 11: 451

design for oil storage tanks, 11: 10583(J)

design for pressurized reactors, 11: 10923(R)

design for Submarine Intermediate Reactor Mark A, 11: 452

design of remote, 11: 9570(P)

electromagnetic, for NaK, 11: 10921(R)

liquid-metal, design, 11: 13868(R)

for liquid Na, design, 11: 11746(R)

for liquids, measurement precision, 11: 2330

remote, using magnetic float, differential transformer and selsyn system, 11: 5104(P)

temperature effects on liquid, for Homogeneous Reactor Test replacement heat exchanger, 11: 8166

Level regulators

design of Homogeneous Reactor Test pressurizer float, 11: 9701

Levinthal Electronic Products, Inc., Redwood City, Calif.

progress reports, 11: 11323(R)

Lid Tank Facility

construction and instrumentation, 11: 8705(R)

design, 11: 9860

Lid Tank Facility (cont'd)

gamma-ray and neutron attenuation in, 11: 6132

source plate design, 11: 1618(R)

LIDO

criticality studies, 11: 5597

instrumentation and control, 11: 8182(J)

Life spans

radiation and temperature effects in rats, 11: 10394

Light

(See also Infrared radiation; Optical systems; Quantum mechanics; Scintillation detectors; Ultraviolet radiation.)

absorption by complex compounds, theory, 11: 165(J)

amplification by optical regeneration, 11: 4899

scattering by colloidal systems, bibliography, 11: 6761(J)

scattering functions for spherical particles, 11: 11272(J)

scattering with NaCN crystals, 11: 4757(J)

velocity, measurement, 11: 1920(R)

Light sources

radiation effects on light bulbs, 11: 11566(R)

Lignite deposits (S. Dak.)

uraniferous, occurrence in Cave Hills, 11: 4434

Lignite deposits (U. S.)

bibliography of the geology of U-bearing, 11: 11189

Lignites

processing for U extraction, 11: 2355(R), 10480, 11647(R)

Limestone

absorption of waste hydrogen fluoride by, 11: 8431

Limestone deposits (Wyo.)

occurrence in Mayoworth Area, 11: 3830(J)

Linden Labs., Inc., State College, Penna.

progress reports on ceramic dielectrics, 11: 3387(R)

Line recorders

(See also Mass spectrometers.)

design for isotope analysis of process gas streams, 11: 8995

design for small linear measurements of transformer, 11: 2573

diffusion pumps and traps for, evaluation of, 11: 13847

ion source, modification, 11: 3463

modification of standard, 11: 3463

modified to high resolution unit, 11: 2602

Linear accelerators

(See also Cockcroft-Walton accelerators; Van de Graaff accelerators.)

achromatic beam translation systems, 11: 4139(J)

alternating gradient focusing, 11: 3185(J), 9148(J)

alternating phase focusing in, 11: 3185(J)

auxiliaries, injector mechanism, prestripper, stripper and poststripper, 11: 3589

cavity for sparking tests of gaps corresponding to 0.45 to 4.5 Mev beam energy, 11: 2745

Cherenkov radiation and beam stability in waveguides, 11: 3185(J)

design, construction at Orsay, France, 11: 10768(J)

design of a single-cavity prebuncher, 11: 1354

design of 4-Mev, 11: 5464(J)

design of heavy-ion, 11: 13529

Linear accelerators (cont'd)

design of high-current, 11: 3185(J)

design of large current low energy storage, 11: 7868

design of proton, 11: 3185(J)

development for producing ions of masses up to that of Ne with energies of 10 Mev/nucleon, 11: 3589

electroforming of structures for, 11: 11203

electron, as a pulsed radiation source, 11: 6943(J)

figure of merit of idealized Sloan and Lawrence, 11: 5632

focusing by periodic changing of the synchronous phase position, 11: 10328

ion sources, high current injector for, 11: 3591(J)

microwave, design study, 11: 3185(J)

operation, 11: 1542(R)

plasma waveguides as accelerating structures in, 11: 3185(J), 9497

power supplies, traveling wave magnetron amplifier operation as, 11: 6129

proton orbits in Brookhaven, 11: 3185(J)

strong focusing modification, 11: 3263(P)

waveguide for, incorporating a helical conductor, 11: 10327

waveguide for proton, series impedance and attenuation length of helical, 11: 2156(J)

wedge filter for use with 4 Mev, design, 11: 10330(J)

Linoleic acids

fractionation and radiation effects, 11: 12959(R)

metabolism, 11: 13566(R)

metabolism in rats, 11: 7398(R)

Linoleic acid (labeled)

preparation, 11: 13565(R)

Lipids

(See also Fatty acids.)

chromatographic determination in blood plasma, 11: 1431

infrared absorption determination, 11: 1777

radiation effects on concentration in rabbit plasma, 11: 11868(J)

Lipoproteins

analysis for amino acids, 11: 911

blood plasma levels following irradiation as determined chromatographically, 11: 108

metabolism, influence of desiccated thyroid substances, 11: 4221

metabolism in health and disease, 11: 12(R)

radiation effects on chemical composition, 11: 8259(R)

sedimentation properties of, from chicken embryo plasma, 11: 2237(R)

Liquid baths

for uranium heating, preparation, 11: 7656(R), 7657(R)

Liquid flow

transition process and other phenomena of viscous, 11: 8896(J)

Liquid jets

atomization, 11: 7223

Liquid metal brushes

mechanical properties for high current, low voltage generator, 11: 3906

Liquid metal cooled reactors

(See also specific liquid metal cooled reactors, e.g., Experimental Breeder Reactor; Liquid Metal Fuel Reactor; Sodium Reactor Experiment; Submarine Intermediate Reactor.)

advantages and disadvantages for producing electricity, 11: 3557

Liquid metal cooled reactors (cont'd)

barrier materials for use between Na and H_2O in, 11: 2438

benzene turbine cycle in Na cooled, thermodynamic investigation, 11: 1041

calrod insertion forces, 11: 12557

cost factors using U–Zr fuel alloys, 11: 8687(R)

cost-temperature ratios, 11: 13503(R)

decontamination of Na system components, 11: 7931

design and evaluation as power-breeder, 11: 12596

design and safety, 11: 10276

design for power production, 11: 681(J), 2775(J), 4112(J), 8687(R)

design of power breeder, proposed program, 11: 8665

design of sodium graphite, 11: 8696(R), 13190

fuel element cans for wafer-type fuel elements, 11: 11550(P)

fuel element design for, 11: 7853

fuel element economics, 11: 9464

fuel element testing, 11: 12508(R)

metals for survey, 11: 4695(J)

nuclear and performance calculations, 11: 7850(R)

plutonium concentration in, control, 11: 7547

safety evaluation, 11: 7849

shield coolants, properties, 11: 7429(R)

shielding requirements, 11: 12629

Liquid Metal Fuel Reactor

bismuth-coolant decontamination, 11: 9640

bismuth corrosion loops status report, 11: 8446

breeder blanket, 11: 11752(R)

breeding blankets for, chemical processing and group calculations, 11: 7734(R)

chemical properties of fuel for, 11: 10925(R)

component development, 11: 7710(R)

control rods, mathematical analysis for grey, 11: 12219

control rods, two group theory for, 11: 12218

delayed neutron flux distribution, 11: 12223

design, 11: 681(J), 13965

design, breeding blankets, cooling system, and fuels, 11: 7691(R)

design, breeding blankets and fuel alloys, 11: 7709(R)

design and development, 11: 12214(R)

development, 11: 10747(J), 13886(R)

development and problems, 11: 1661(J)

fission product removal, flow diagram, 11: 11752(R)

heat reject system design, 11: 9093

in-pile loop performance, 11: 7738(R)

metallurgy studies for, 11: 11838(R)

moderator temperature coefficient time constant, calculations, 11: 12220

neutron flux distribution and shielding equipment, 11: 12221

power regulation methods and fuel processing, 11: 13885(R)

reflector temperatures, 11: 11396

safety, preliminary hazards report, 11: 12217

shielding requirements, 11: 12222

test program outline, 11: 12875

thermal analysis, 11: 11395

Liquid metal–fused salt systems
See Fused salt–liquid metal systems.

Liquid metal slurries
gamma attenuation measurement of fuel particle size and concentration, 11: 4687
preparation and properties, 11: 13486
properties and processing of UO_2–Na, 11: 10724
properties of UO_2–NaK, for reactors, 11: 13516(J)
sedimentation rate measurement, 11: 4822

Liquids
diffusion and molecular reactivity, 11: 4005(J)
diffusion in H_2–D_2O and sucrose–H_2O systems, 11: 7088(R)
dynamic compression by strong shock waves, 11: 6647(J)
electron scattering, 11: 3901(J)
energy and entropy, effect of volume and temperature on, 11: 6241(J)
equation of state, 11: 6633
fluorescence of organic systems of, energy transfer mechanisms, 11: 1178(R)
gas bubbles in, size measurement, 11: 446(J), 461(J)
heat capacity, estimation by empirical methods, 11: 10115(J)
heat-flux for boiling of saturated, 11: 6707(J)
heat transfer, 11: 11669
mixing and mass transfer, 11: 10584
monitoring of radioactive, design of continuous β–γ monitor for, 11: 3477
nuclear magnetic resonance spectra, 11: 10018(J)
penetration in crystals, statistical analysis, 11: 10450, 10451, 10452
positronium formation in, 11: 6495(J)
properties, design of all metal systems for studying, 11: 6666(J)
radiation effects, 11: 7405(R)
radiolysis, chemical evidence of tract effects, 11: 4343(J)
structure of, neutron-scattering analysis, 11: 591(J)
theory, 11: 6976(J)
thermal conductivity, equipment design, 11: 1855(J)
thermal conductivity, of non-metallic liquids and pure liquid metals, equations for estimating, 11: 2552
thermodynamic properties of, design of calorimeter for measuring, 11: 6792(J)

Lithium
application of the self-consistent field linear combination of atomic orbitals molecular orbital method to Li_2, 11: 12075(J)
corrosion studies of heat-transfer media, 11: 13516(J)
in cosmic radiation at $\lambda = 41.5°$, intensity of nuclei, 11: 3448(J)
determination in alundum and Li–Al, 11: 8264
determination in basic solutions, 11: 11578(R)
deuteron reactions (d,n), 11: 9778
deuteron reactions (d,n), angular distribution of neutrons from, nuclear emulsion technique for studying, 11: 3497(J)
electron energy loss and straggling at 150 Mev, 11: 4152(J)
electronic states of Li_2, 11: 12084(J)
flame photometric determination in mixtures, 11: 1780(J), 5796(J)
formation in solar atmosphere, mechanism, 11: 8192(J)
gamma reactions, 11: 4115, 5655(J)
industrial uses, 11: 8881(J)
isotopic analysis by optical spectrography, 11: 7406(R)
mass spectrographic analysis, 11: 110, 8294, 13383
meson (π^+) production by 340-Mev protons by, 11: 5989(J)

Lithium (cont'd)
mesonic decay of hyperfragment, 11: 1283(J)
neutron elastic scattering cross sections, 11: 2174(J)
neutron reactions, effect on gas formation, 11: 3577
neutron yields from deuteron reactions, 11: 8726
nucleon momentum in, from high-energy photoeffect, 11: 3021(J)
proton inelastic scattering at 12 Mev, 11: 4994(J)
proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)
protons scattered at 96 Mev by, energy spectrum, 11: 612(J)
separation from K and Na and determination by dipivaloylmethane, 11: 121(J)
separation from ores, 11: 8881(J)
separation from silicate ores, 11: 9527(P)
spectrographic analysis, 11: 2283
spectrographic determination in kaolins by emission spectroscopy and flame photometry, 11: 13265
spectrophotometric analysis for Li_2C_2 and Li_3N, 11: 5212
spectrophotometric determination in Be, 11: 10813(R)
structure, effect of magnetic hyperfine coupling, 11: 538
thermal and electrical conductivity from 2 to 90°K, 11: 1188(J)

Lithium (liquid)
corrosive effects on Fe, 11: 8745
corrosive effects on Fe and Ni alloys, 11: 4464(R)
isotope effect by passage of current in, 11: 6796(J)
radiation effects, x-ray-diffraction analysis, and containers, 11: 8747(R)
static corrosion of metals and alloys by, 11: 9747

Lithium alloys
crystal structure, 11: 1878

Lithium–aluminum alloys
See Aluminum–lithium alloys.

Lithium aluminum hydrides
hydrogenation properties, 11: 13259(J)
reactions with $CoBr_2$, 11: 915(J)

Lithium–aluminum–silicon systems
See Aluminum–lithium–silicon systems.

Lithium borates
preparation for mixed resins, 11: 177(R)
reactor criticality effects in Pressurized Water Reactor, and effects on reactor materials, 11: 8716(R)
solubility test in a dynamic system, 11: 13601

Lithium borohydrides
aminolysis, 11: 13825(R)
heat of solution in liquid NH_3, 11: 3681
reactions with $CoBr_2$, 11: 915(J)

Lithium bromides
infrared spectrum, 11: 6164(J)

Lithium carbides
electrical conductivity and bonding, 11: 6636(J)
spectrophotometric determination in Li, 11: 5212

Lithium carbonate–uranium oxide systems
corrosive effects testing program, 11: 12464

Lithium carbonates
chemical determination in LiH, 11: 13268

Lithium chloride–barium chloride systems (liquid)
See Barium chloride–lithium chloride systems (liquid).

Lithium chloride–potassium chloride systems

density and electric conductivity, 11: 9587(R)

electrical conductivity, 11: 3688(J)

preparation of LiCl–KCl eutectic solvent, 11: 9991(J)

Lithium chloride–potassium chloride systems (liquid)

chronopotentiometric analysis for $BiCl_3$, $CdCl_2$, AgCl, and CuCl, 11: 2834(J)

corrosive effects, 11: 13885(R)

electrolytic recovery potentials at 500 to 700°, 11: 8021(J)

preparation of LiCl–KCl eutectic solvent, 11: 9991(J)

viscosity, 11: 7691(R)

Lithium chloride–potassium chloride–uranium(III) chloride systems (liquid)

electrolysis for production high purity U, 11: 7568(R)

Lithium chloride–potassium chloride–uranium(IV) fluoride systems (liquid)

electrolysis for production high purity U, 11: 7568(R)

Lithium chlorides

(See also specific lithium chloride systems, e.g., Cesium chloride–lithium chloride systems.)

chromatographic separation from alkali metal halides using C_6H_5OH–CH_3OH–HCl, 11: 4830(J)

infrared spectrum, 11: 6164(J)

phase studies of stratified structure in fused, 11: 382(J)

Lithium compounds

absorption on orthophosphate and phosphonate polymers, 11: 4373

Lithium deuterides

deuteron reactions (d,n), 11: 9778

thermodynamic properties, phase studies, 11: 4811

Lithium fires

control, extinguishing agents for, 11: 3855

Lithium fluoride–beryllium fluoride–sodium fluoride systems
See Beryllium fluoride–lithium fluoride–sodium fluoride systems.

Lithium fluoride crystals

absorption spectra, radiation effects on, 11: 7406(R)

absorption spectra of irradiated, 11: 13578(R)

bubble formation in irradiated and annealed, 11: 11965(J)

internal defects, anomalous plane-geometric voids in irradiated, 11: 9241

internal defects, cavities in neutron-irradiated, 11: 8850(J)

neutron-induced lattice defects in, temperature dependence, 11: 4167

neutron radiation effects, reassembly of interstitial atoms, 11: 12290(J)

radiation effects, 11: 13834(R)

thermal release of charge carriers in irradiated, 11: 13578(R)

Lithium fluoride–sodium fluoride systems

enthalpy, heat capacity, and heat of fusion, 11: 13614

Lithium fluoride–sodium fluoride–zirconium fluoride systems

enthalpy, heat capacity, and heats of phase transition, 11: 13615

Lithium fluorides

(See also specific lithium fluoride systems, e.g., Calcium fluoride–lithium fluoride systems.)

lattice parameter measurements of single crystals, 11: 5798

linear expansion under neutron irradiation, 11: 12291(J)

neutron radiation effects, 11: 9771(R)

radiation effects, 11: 7455(R), 13834(R)

spectra, 11: 9579(R)

Lithium fluorides (liquid)

thermal conductivity and theoretical equations for estimating, 11: 2552

Lithium halides

energy level calculations for F-centers and interstitial positive ions in, 11: 12777

Lithium hydride–lithium systems
See Lithium–lithium hydride systems.

Lithium hydrides

(See also specific lithium hydride systems, e.g., Lithium–lithium hydride systems.)

chemical analysis for Li_2CO_3, 11: 13268

exchange reactions of hydrated, with water, 11: 9664(R)

ground state calculation, 11: 538, 4490(R)

molecular calculations, corrections, 11: 6855(R)

thermodynamic properties, phase studies, 11: 4811

Lithium hydroxides

concentration by electrodialysis, 11: 11648

corrosion of U in aqueous solutions of, 11: 10872

corrosive effects on steel, 11: 10986(R)

effects of adding H_2 on O concentration in irradiated, 11: 8715(R)

qualitative and quantitative analysis, 11: 178(R)

Lithium hydroxides (liquid)

corrosive effects, 11: 8717(R)

Lithium iodide crystals

scintillation response to monoenergetic fast neutrons, 11: 484

use in neutron spectrometers, 11: 4568

Lithium iodides

analysis for europium, 11: 8285(R)

infrared spectrum, 11: 6164(J)

Lithium ions

electron-loss cross sections, 11: 7347(J)

penetration through Al layers, 11: 8023(J)

range-energy relation in nuclear emulsions, 11: 5648(J)

range-energy relationships and change of charge as a function of ion velocity, 11: 7348(J)

source development for accelerators, 11: 5640(J)

stopping power of gases for, 11: 1960(J)

Lithium isotopes

analysis by special mass spectrometer, 11: 1570

separation by photoexcitation, 11: 13844

spectrographic determination, 11: 9579(R)

Lithium isotopes Li^6

alpha-particle scattering at 31.5 Mev, 11: 746(J)

alpha reactions (α,γ), gamma energies from, 11: 10231(R)

beta decay, spin-momentum correlations in, 11: 10231(R)

deuteron reactions, 11: 698(J), 4127(J), 5045(J)

deuteron reactions and energy levels, 11: 11364(J)

energy levels, 11: 4127(J), 4992(J), 5546(J), 6060(J), 6156(J)

gamma reactions (γ,n), cross section at 6.2 Mev, 11: 4572(J)

helium nucleus reaction mechanisms (He^3,p), 11: 2089(J)

lithium ion reactions (Li^7,p), 11: 4125(J)

measurement in meteorites by neutron activation, relation to cosmic radiation, 11: 8000(J)

mobility in molten LiCl–$PbCl_2$ mixtures, conversion measurement for determination of, 11: 7253(J)

neutron capture cross sections, 11: 1278(R)

Lithium isotopes Li^6

neutron reactions, 11: 1278(R), 3584(J), 4119(J)

neutron reactions (n,α), 11: 9752(R)

neutron total cross sections, 11: 7690(R)

pion production cross sections, 11: 4713(J)

proton reactions, 11: 702(J), 3090(J)

x rays, proportional counter measurements of π-mesonic, 11: 12172(J)

Lithium isotopes Li^7

alpha reactions (α,γγ), angular distribution of γ rays in, 11: 6863(R)

deuteron reactions, 11: 693(J), 4127(J), 5628(J)

deuteron reactions and energy levels, 11: 11364(J)

deuteron reactions (d,pn), calculated angular distributions, 11: 12277(J)

energy levels, 11: 3095(J), 6156(J)

energy levels, shell model interpretation, 11: 12206(J)

enrichment by ion exchange, 11: 8283(R)

formation during $Li^6(n,t)He^4$ reaction, p-interaction effects on, 11: 4119(J)

gamma reactions (γ,α), 11: 9752(R)

lithium ion reactions (Li^7,p), 11: 4125(J)

mobility in molten LiCl–$PbCl_2$ mixtures, conversion measurement for determination of, 11: 7253(J)

neutron-alpha angular correlation in deuteron reactions $Li^7(d,\alpha)$ and the ground state of He^5, 11: 9492(J)

neutron reactions, 11: 2737, 3584(J)

neutron total cross sections, 11: 7690(R)

pion production cross sections, 11: 4713(J)

proton reactions (p,α), angular distribution and effective cross section, 11: 8143(J)

proton reactions (p,n), 11: 4614(R), 10229, 13114(R)

spin-orbit coupling in, 11: 9752(R)

x rays, proportional counter measurements of π-mesonic, 11: 12172(J)

Lithium isotopes Li^8

emission from heavy element disintegrations produced by 5.7-Bev protons, 11: 5624(J)

Lithium–lithium hydride systems

phase studies and freezing points, 11: 11059

thermodynamic properties, phase studies, 11: 4811

Lithium–magnesium alloys

corrosion in sodium chloride solutions and sea water, 11: 319

magnetic susceptibility, measurement, 11: 8920

mechanical properties, effect of alloying elements on the stability of, 11: 5359(J)

plastic deformation, fracture, grain structure, heat treatment, and stress in alpha solid solutions, 11: 2918

Lithium–mercury alloys

decomposition kinetics, 11: 9587(R)

reduction of UCl_4 and $ThCl_4$ with, 11: 8411(R)

Lithium minerals

prospecting in U. S. and Canada for, 11: 3411(J)

Lithium nitrates

crystal structure, x-ray measurements of thermal expansion, 11: 1206(J)

molten, effects on Ni, Co, Al, and some types of steel, 11: 1918(J)

vapor pressure of aqueous solutions, 11: 7861(R), 12320

Lithium nitrides

spectrophotometric determination in Li, 11: 5212

Lithium ores

processing, 11: 8881(J)

Lithium oxides

(See also specific lithium oxide systems, e.g., Calcium oxide–lithium oxide–silicon oxide systems.)

compressibility of SiO_2–Li_2O system, 11: 7102(J)

Lithium sulfates

(See also Ammonium sulfate–lithium sulfate–water systems.)

chemical properties, 11: 11770

corrosion inhibition of UO_2SO_4 solution on stainless steel, Zircaloy-2, and Ti, 11: 12463

corrosive effects of UO_2SO_4–Li_2SO_4 systems, 11: 13745

electric quadrupole interactions of deuterons and molecular motion in $Li_2SO_4 \cdot D_2O$, 11: 6041(J)

vapor pressure of aqueous solutions, 11: 12320

Lithium titanates

fusion with fluorides, sulfates, silicates, pyrophosphates, and other salts of Li, Na, and K, 11: 381(J)

phase studies, fusion with different salts, 11: 381(J)

Lithium tritides

thermodynamic properties, phase studies, 11: 4811

Lithium tungstates

phase studies, stratified structure in fused, 11: 382(J)

Little Belt Mountains (Mont.)

geology and geophysical exploration in Meagher, Cascade, Judith Basin, and Wheatland Cos., 11: 4435

Liver

biochemical changes in radiation sickness, 11: 3670(J)

catalase and uricase content in rat and mouse, 11: 7910(R)

catalase levels, effects on radiosensitivity of rats, 11: 54(J)

effects of shielding during irradiation on blood serum Fe levels, 11: 1725(R)

function tests, 11: 12960(R), 13566(R)

function tests, tracer techniques, 11: 2233(R), 7695(R), 10803(R)

hemolytic factor in x-rayed rats, origin and mode of accumulation, 11: 841(J)

radiation effects, 11: 20, 1398, 1739(J), 4225, 5743(J), 7072(J), 10400(J), 13242(J)

radioinduced changes in metabolism, 11: 20, 3658(J), 3659(J), 4230(J)

uptake of colloidal radioactive chromic phosphate, 11: 1762, 4233(J), 6218

uranium content in beef, 11: 1434(J)

Livermore Pool Type Reactor

design description, 11: 13505

Livermore Research Lab., Calif. Research and Development Co.

progress reports on Materials Testing Accelerator Project, 11: 8730(R)

Loa Quadrangle (Utah)

preliminary geologic map, 11: 9297(J), 9298(J), 9299(J)

Loaded plastics

physical properties of a plastic fluor containing terphenyl, alpha-naphthyl phenyloxazole, and zinc stearate in a styrene base, 11: 1580

Lone Eagle Mine (Mont.)

geology and vein deposits, 11: 2908(J)

mineralogy of, in the Boulder Batholith, 11: 5863(J)

Long cartridges

flexure testing, 11: 8494

Loops

See Corrosion loops; In-pile loops.

Lopo

See Los Alamos Water Boiler.

Los Alamos Fast Reactor

design, control, operation, and nuclear characteristics, 11: 12598

disassembly, 11: 12570

neutron flux distribution, 11: 13952

neutron flux distribution, Monte Carlo calculation, 11: 7707

Los Alamos Molten Plutonium Reactor Experiment

design, 11: 7329

Los Alamos Plutonium Reactor
See Los Alamos Fast Reactor.

Los Alamos Power Reactor Experiment

criticality studies, design, radiation hazards, and γ heating, 11: 11420

design, 11: 681(J), 6092

design and safety features, 11: 4688

research program at Los Alamos, 11: 13165

Los Alamos Water Boiler

control, operation, and reactivity, 11: 7785

design and operation, 11: 591(J)

Los Chanares Area (Argentina)

geologic, radiometric, and botanical exploration in, 11: 13327(J)

Louisville, Ky. Univ. Inst. of Industrial Research

progress reports on chemistry, 11: 2278(R)

Low Cost Reactor
See Swimming pool reactors.

Low Intensity Training Reactor
See Materials Testing Reactor Mockup.

Low power reactors
See Research reactors.

Low Power Research Reactor

design and criticality studies, 11: 9841

design studies, 11: 8696(R), 13171

fuel element design, 11: 7842(R)

fuel element fabrication, 11: 13967

fuel element preparation, 11: 13113(R)

fuel element particle size effects on heat transfer, 11: 9840

fuel elements, fabrication and testing, 11: 8547(R)

hazards summary, 11: 4094

loading, reactivity, and control studies, 11: 9839

shielding requirement calculations, 11: 10969

specifications, 11: 7850(R)

warmup of, Ar^{41} activity from, 11: 2721

LPRR
See Low Power Research Reactor.

LPT Reactor
(Low Power Test reactor for studies on the Initial engine test which see.)

LSR
(Large Ship Reactor). See Carrier vessel reactor.

Lubricants

(See also Greases; Lubrication; Oils.)

analysis, laboratory manuals for, 11: 11088

chemical and high-temperature properties, 11: 8826(R)

chromatographic separation and infrared spectra of irradiated, 11: 964

corrosion and oxidation, effects of temperature on, 11: 6710(R)

development, radiation effects, 11: 6710(R)

Lubricants (cont'd)

development and properties, 11: 11156(R)

development of high-temperature stable and radiation resistant, 11: 11133(R)

development of radiation resistant turbine engine, 11: 11959(R)

effects of radiation and temperature on, 11: 11158(R)

high-temperature, development, 11: 1765(R), 4378(R), 4419(R), 4420

high temperature, preparation and properties, 11: 11057(R)

high-temperature properties, 11: 12670(R)

mechanical evaluation, 11: 11223

oxidation, 11: 910(R)

performance, 11: 8007(R)

performance of, in drawing zircaloy, 11: 7646(R)

performance of dry film, 11: 7981

preparation and properties, 11: 3369

properties, chemical base coating for Zr and Sn–Zr alloys, 11: 2914

properties and uses of Electro film solid coating, 11: 2414

radiation effects, 11: 7961, 11469, 12693(R), 12985, 13597(R)

radiation effects on aircraft, 11: 8822

radiation effects on corrosiveness, 11: 5244

radiation effects on organic compounds to be used as, 11: 12984

radiation effects on turbine engine, 11: 11109

radioactivation analysis for V, 11: 2261

for seals of the Submarine Intermediate Reactor, 11: 11788

testing for lubrication of high speed anti-friction bearings, 11: 1184(R)

testing, for Ti, 11: 11217(R)

testing of, for bearings, 11: 12668(R)

Lubrication

relations of temperature to boundary, survey, 11: 254

Lucky Uranium Deposit (Wyo.)

geologic map, 11: 1088(J)

Luminescence

(See also Fluorescence; Phosphorescence; Thermoluminescence.)

charged particle and strong emission effects on, of organic matter, 11: 31(J)

of fluoride crystal dye centers, absorption spectra, emission and energy band structure, theory, 11: 147(J)

of modified tin-activated $Sr_3(PO_4)_2$, 11: 9221(J)

reinforcement of, from α scintillations by electric fields, 11: 416(J)

review of articles on, in 1955-1956, 11: 9992(J)

spectra activated by Pr, Sm, Eu, Gd, Tb, Dy, Ho, Er, and Tu in CaF_2 crystals, 11: 787(J)

theory and investigation of, 11: 5376(J)

of zinc sulfide phosphors activated by β isotopes, 11: 10183(J)

Luminescent detectors

performance, 11: 3479(R)

Luminescent materials

pressure effects, 11: 12070

Lungs

particle absorption and retention, 11: 8258(R), 12960(R)

particle absorption and retention, effects of particle size, 11: 9576(R)

pathological effects of absorbed radioactive particles, 11: 1392, 1726(J), 7051(J), 8257(R), 11877(R)

pathological effects of inhaled Be sulfate in rats, 11: 2805(J)

radiation dosage determinations, 11: 2238, 2803(J), 2991(J)

Lungs (cont'd)

radiation effects, following radiotherapy of breast carcinoma, 11: 13244(J)

radioinduced lesions in rat, 11: 38(J)

radioinduced lesions, effects of cortisone and antibiotic therapy, 11: 9964(J)

uptake and retention of Po^{210} colloid and Po^{210}-tagged silver particles in rabbits, 11: 2808

Lutetium

absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969

infrared resonance lines, 11: 2200(J)

infrared spectra, 11: 2200(J)

ion exchange using ENTA, 11: 6302(J)

metallic phase studies, 11: 8117(R)

physical and chemical properties, 11: 5816(J)

tissue distribution in dogs, tracer study employing Lu^{177}, 11: 4262(J)

Lutetium isotopes Lu^{169}

gamma spectra, formed in a spallation reaction, 11: 12941

Lutetium isotopes Lu^{174}

isomeric transitions, 11: 9518(J)

Lutetium isotopes Lu^{175}

energy levels, 11: 1648(J), 3527(J), 3533(J), 11740(R)

internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

quadrupole moments, 11: 4646(J)

Lutetium isotopes Lu^{176}

electron capture in decay of, search for, 11: 8223(J)

preparation and half life, 11: 4262(J)

Lutetium isotopes Lu^{177}

beta decay, 11: 8150(J)

gamma cascades in decay of, directional correlation measurements, 11: 3061(J)

preparation and half life, 11: 4262(J)

tissue distribution in dogs, 11: 13256(J)

Lymph diseases

radiochemical therapy, value in lymphoblastomata, 11: 11892(J)

Lymph system

glucuronidase activity, effects of whole-body x irradiation in rats, 11: 5717(J)

radiation effects, quantitative aspects, 11: 8781(J)

Lysines

occurrence in pyridine ring of nicotine, 11: 3323(J)

M

M-Capture

See Electron capture.

Machining

(See also Grinding.)

tolerance standards for geometric characteristics of form and position, 11: 2524

Magnesium

activation determination in NiO_2, 11: 8296(R)

bonding to Al, 11: 13794(R)

Magnesium (cont'd)

bonding to Al by pressure welding and cold rolling, 11: 9737(R)

burning-propagation rates in O_2, 11: 5330(R), 10886(R)

corrosion, effects of high melting additions, 11: 11221

corrosion inhibitors, development of organic compounds as, 11: 5308

corrosion products on, bibliography, 11: 12031(J)

creep, effects of dispersions of oxides on, 11: 5360(J)

creep and rupture stresses at high temperatures for jet applications, 11: 307

diffusion in MgO crystals, 11: 3686

diffusion in Zr, 11: 9326

distillation, apparatus for, 11: 13582(R)

elastic constants, 11: 8025(R)

elastic properties and damping capacity, effect of temperature on, 11: 343(J)

elastic shear constants, calculation of, 11: 10549

electrodeposition from organic solutions, 11: 1898(J), 3865(J)

extrusion, 11: 8516(R)

flame photometric determination, 11: 12973(R)

gamma absorption, 11: 10521(R)

heat capacity between 20° and 270°C, 11: 4462(R)

high-temperature separation process for U and Pu using, 11: 7973(J)

ion exchange behavior on Dowex-50, 11: 5276(J)

mechanical properties, effects of high melting point additions on, 11: 11221

metabolism, 11: 12(R)

microstructure, effects of high melting point additions on, 11: 11221

neutron activation, for reactor flux measurements, 11: 12519

neutron production by μ mesons stopped in, 11: 6114(J)

neutron reactions, 11: 3577, 3585(J)

neutron total cross sections, 11: 1287

oxidation by water vapor, kinetics of, 11: 12732

oxidation of powdered, kinetics, 11: 3806

photoemission and secondary electron discharge additivity of, 11: 1944(J)

photoneutron yields from natural, 11: 3088(J)

proton elastic scattering by, absolute differential cross sections, 11: 8210(J)

proton scattering by, 11: 612(J), 1369(J), 4994(J)

radiographic inspection, 11: 10521(R)

reactions with water vapor, 11: 9220(J)

reducing agent for production of U from UF_4, 11: 9537(P), 9544(P)

separation from Ca by sublimation, 11: 7677(R), 8512(R)

solid-solution hardening, 11: 9340(J)

spectrographic analysis for Ce, La, Nd, Pr, and Th, 11: 3705(J)

spectrographic and colorimetric analysis for SiO_2, 11: 10810(R)

tertiary creep in sublimed, 11: 5349

thermal capacity, determination between 20 and 270°C, 11: 2920(R)

volumetric determination in water, 11: 9227, 9228

Magnesium (liquid)

corrosive effects on Croloy, 11: 7734(R)

corrosive effects on Fe base alloys at 1150°C, 11: 9580(R)

extraction of U and Pu with, 11: 7407(R)

heat transfer properties, 11: 8672

Magnesium (liquid) (cont'd)

physical properties, 11: 8672

solubility of U in, 11: 11978

Magnesium alloys

chemical analysis for Th and Zr, 11: 11089

corrosion, 11: 3429(R), 11221, 11688(R)

corrosion by water, 11: 13794(R)

creep-rupture, effects of thermal cycling on, 11: 1136(R)

elastic shear constants, calculation of, 11: 10549

electrodeposition from organic solutions, 11: 3865(J)

extrusion, 11: 3429(R)

fluidity and fracture, factors effecting, 11: 6742

high-temperature properties, 11: 323, 1136(R), 4881, 10578(J)

mechanical properties, 11: 3429(R)

mechanical properties, effects of high melting point additions on, 11: 11221

microstructure, effects of high melting point additions, 11: 11221

preferred orientation in, 11: 3429(R)

properties of, for reactor process tubes, 11: 6370, 8170

radiation effects, 11: 2456

radioautographic analysis for Th, 11: 5893

structure of binary intermetallic compounds, bibliography, 11: 4879

tensile properties, effects of strain rate and temperature holding time on, 11: 2925

tensile properties, effects of thermal cycling on, 11: 1136(R)

testing, methods and evaluation, 11: 12020

thermal capacity, 11: 4817

Magnesium–aluminum alloys
See Aluminum–magnesium alloys.

Magnesium aluminum hydrides

hydrogenation properties, 11: 13259(J)

Magnesium–aluminum–titanium alloys
See Aluminum–magnesium–titanium alloys.

Magnesium–aluminum–uranium alloys
See Aluminum–magnesium–uranium alloys.

Magnesium–cadmium alloys
See Cadmium–magnesium alloys.

Magnesium–cerium alloys
See Cerium–magnesium alloys.

Magnesium cerium nitrates

preparation of crystals of the double salt, 11: 10687(R)

Magnesium chlorides

alkali chloride melts, activity, calculations, 11: 339(J)

Magnesium–cobalt alloys
See Cobalt–magnesium alloys.

Magnesium complexes

with nitrosonaphthol, formation constants, 11: 4301(J)

Magnesium compounds

formation and high-temperature properties of $MgO \cdot 3BeO$, 11: 4428(J)

Magnesium–copper alloys
See Copper–magnesium alloys.

Magnesium–copper coatings
See Copper–magnesium coatings.

Magnesium crystals

elastic constants from 4.2 to 300°K, 11: 13419(J)

Magnesium fluorides

(See also specific magnesium fluoride systems, e.g., Calcium fluoride–magnesium fluoride systems.)

precipitation from aqueous solutions, 11: 3350(J)

reaction kinetics with H_2SO_4, 11: 10812(R)

spectrophotometric analysis for Si, 11: 1429(R)

Magnesium–germanium alloys
See Germanium–magnesium alloys.

Magnesium–germanium crystals
See Germanium–magnium crystals.

Magnesium hydrides

preparation, 11: 9329

Magnesium–hydrogen systems
See Hydrogen–magnesium systems.

Magnesium isotopes

alpha reactions, 11: 691(J), 6057(J)

neutron reactions (n,p), energy spectrum of protons from, 11: 695(J)

Magnesium isotopes Mg^{24}

alpha-particle scattering at 31.5 Mev, 11: 746(J)

deuteron reactions (d,α), excitation function, 11: 12196(J)

deuteron reactions (d,p), 11: 6116, 6513(J)

energy levels, 11: 1344, 1346(J)

excited states, parity, 11: 4059(J)

gamma rays from reaction $Mg^{24}(p,\gamma)Al^{25}$, investigation, 11: 708(J) 709(J)

neutron reactions (n,p), proton spectra, 11: 12863(J)

nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)

proton inelastic scattering by, absolute differential cross sections, 11: 8210(J)

proton reactions (p,γ) and (p,$\gamma\gamma$), 11: 1278(R)

proton scattering at 10 Mev, 11: 1368(J)

Magnesium isotopes Mg^{25}

energy levels, 11: 1643(J), 6513(J)

nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)

proton reactions, interpretation, 11: 5627(J)

Magnesium isotopes Mg^{26}

decay schemes, 11: 5179(R)

deuteron reactions (d,p), probability of stripping and compound nucleus formation, 11: 4126(J)

neutron capture reactions in, 11: 4978(J)

nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)

proton reactions (p,γ), resonances, 11: 6121(J)

Magnesium isotopes Mg^{27}

energy levels from Al^{27}(n,p) reaction, 11: 9494(J)

neutron capture cross sections, 11: 4978(J)

Magnesium isotopes Mg^{28}

beta emission, 11: 10996(R)

preparation by $Al^{27}(\alpha,3p)$ reaction, 11: 11308(J)

production in reactor and cyclotron, 11: 4170(J)

Magnesium lanthanum nitrates

radiation damage in, containing radioactive isotopes, 11: 4514(J)

Magnesium–lithium alloys
See Lithium–magnesium alloys.

Magnesium oxide–aluminum oxide systems
See Aluminum oxide–magnesium oxide systems.

Magnesium oxide crucibles
casting process for, 11: 13738
design and performance, 11: 10869, 13582(R)
mechanical properties, 11: 10869
preparation, 11: 10869, 11690(R)
production, 11: 8442
Magnesium oxide crystals
diffusion of Mg in, 11: 3686
paramagnetic resonance, 11: 1922(R)
radiation damage in single, 11: 8216(J)
radiation effects, 11: 8264
Magnesium oxide–nickel systems
fission product permeability, 11: 1316
Magnesium oxide powders
in smoke, particle size measurement by electron microscopy, 11: 13264
Magnesium oxide–uranium oxide systems
thermal expansion from 0 to 400°C, 11: 9743
uranium recovery by fluoride volatility process, 11: 8388(R)
Magnesium oxides
(See also specific magnesium oxide systems, e.g., Boron oxide–magnesium oxide systems.)
band structure, 11: 538
electron-bombardment-induced dissociation, 11: 8217(J)
lattice parameter measurements of single crystals, 11: 5798
physical properties of hot pressed for gas-turbine application, 11: 1065
for precipitation of U refinery wastes, 11: 190(J)
reaction kinetics, 11: 1148(J)
standard sample preparation for spectrographic use, 11: 10812(R)
stripping agent for U in tri-n-octylamine–kerosene, 11: 10036(R)
thermal conductivity, effect of microstructure on, 11: 12728(J)
thermal expansion measurements, 11: 3827(J)
ultraviolet spectra, investigated by means of intensity change and isotope shift, 11: 4855
Magnesium–polonium alloys
preparation and crystal structure, 11: 3413
Magnesium powders
particle size measurement and distribution, 11: 5363
Magnesium silicides
electric properties and Hall coefficient of Mg_2Si, 11: 4453
thermodynamic properties, 11: 8117(R)
Magnesium–stainless steel couples
evaporated and welded, comparison of, 11: 449(R)
Magnesium sulfates
vapor pressure of aqueous solutions, 11: 12320
Magnesium–thorium alloys
creep behavior, effect of alloying elements on, 11: 5349
crystal structure, 11: 3858(J), 5894
crystal structure of, methods for analysis, 11: 7673(R)
phase studies, 11: 5894, 7673(R)
properties, 11: 5894
solvent properties for U, 11: 4454(R), 11703(R)
Magnesium–thorium alloys (liquid)
corrosive effects on Ta, Zr, and Nb, 11: 11703(R)
Magnesium–thorium alloys (liquid) (cont'd)
loop studies with, 11: 2420(R)
solubility of U in, 11: 11978
Magnesium–thorium–zinc alloys
aging characteristics, constitution diagrams, crystal structure, heat treatment, and mechanical properties, 11: 5894
Magnesium–thorium–zirconium alloys
aging characteristics, constitution diagrams, crystal structure, heat treatment, mechanical properties, 11: 5894
Magnesium titanates
breakdown voltage, 11: 261(J)
Magnesium uranate slurries
spectrographic analysis for Al and Ca, 11: 12971(R)
Magnesium uranates
thermal decomposition, 11: 13576(R)
Magnesium–uranium alloys
corrosion, 11: 11702(R)
fabrication and design of fuel slugs, 11: 9742
mechanical properties, 11: 11702(R)
microstructure of, containing small amounts of Mg, 11: 7654(R)
phase studies, 11: 11702(R), 11703(R)
Magnesium–uranium compacts
powder metallurgy, 11: 12477
thermal expansion from 0 to 400°C, 11: 9743
Magnet coils
radiation effects, 11: 7357
Magnetic fields
(See also Electric fields.)
betatron, mathematical analysis, 11: 11458(J)
control, 11: 1674, 3109, 3115
control device for plasma, 11: 13840
controls for Argonne synchrotron, 11: 8199(R)
correction of constant gradient, 11: 719(J)
double focusing, asymmetric, 11: 1194(J)
effect on motion of electrons in plasmas of glow and arc discharges, 11: 8051(J)
effects on shock waves in conducting gases, 11: 6746
effects on transport phenomena in ionized gases, 11: 5399(J)
electron relativistic motion in, quantum effects, 11: 438(J)
focusing properties of axially symmetric, 11: 12131(J)
helical lens focusing, 11: 12109
lines of force in, motion, 11: 7374
mapping, use of iron filings in high-viscosity medium for, 11: 10121(J)
measurement method, 11: 12118(J)
measurement of, produced by ridged pole pieces, 11: 5366
nuclear resonance detector to measure and stabilize, 11: 454
particle betatron oscillations in, 11: 3182(J), 3183(J)
particle orbits, mathematical analysis, 11: 12782(J)
plasma motion across, 11: 3899(J)
production by volume current distributions, theory and mathematical analysis, 11: 11253
properties of axially symmetric, studied by resistance analog device, 11: 5409
relation of eigenpoles to backwound poles, reluctance poles, and other derived pole structures, 11: 6555
strength, effect of power absorption on, 11: 421(J)

Magnetic moments

(See also Nuclear magnetic moments.)

electron, dipole, 11: 10712(J)

Magnetic properties

Curie temperature displacement by hydrostatic pressure, 11: 12095(J)

ferro-antiferromagnetic phase transitions, 11: 7210

radiation effects, 11: 7357

relationship between permeability and hysteresis coefficient, 11: 12759(J)

Magnetic recording systems

application to neutron time-of-flight spectroscopy, 11: 12153(J)

gamma radiation effects on tapes, 11: 4160

for nuclear pulse amplitudes, design, 11: 3926(J)

Magnetic resonance

(See also Nuclear magnetic resonance.)

in carbon compounds, 11: 12069

in metals, theory, 11: 3004(J)

para-, problems, 11: 394(J)

of products from H_2O, H_2O_2, and D_2O vapor discharge, 11: 9239(J)

proton, 11: 6039(J), 6040(J)

a review of nuclear and electronic, 11: 4636(J)

in strongly magnetic semiconductors, 11: 2033(J)

studies of irradiated KCl crystals containing U-centers, 11: 1552(J)

Magnetic susceptibility

methods of measurement in Cu–Ni and Li–Mg alloys, 11: 8920

of palladium, U, and Pd–U alloys, 11: 1914(J)

Magnetism

antiferro-, review, 11: 4496(J)

theory, 11: 2551, 3880(J)

Magnetites

neutron scattering by spin waves in, 11: 9433(J)

sorptive properties, 11: 4264, 5021

Magnetometers

design of dynamic condenser, 11: 6863(R)

design studies, 11: 453, 550(R), 4548(J)

Magnets

characteristics of MTA, measurement of, 11: 14023

cooling of electro-, by liquid H_2 and N_2, 11: 6338(J)

current-pulse testing of, for digital computers, 11: 455

current regulator design for electro-, 11: 9557(P)

description of facilities at Y-12 lab in Oak Ridge, Tenn., 1950, 11: 13846(R)

design for latch, 11: 12511

development of high-intensity, 11: 1355(R), 1356, 1542(R), 3125, 3172, 3180

focusing properties of quadrupole, 11: 4918

lenses, strong-focusing, 11: 3185(J)

mass spectrometer, magnetization of ICPP, 11: 9380

open type electro-, use on shim rods, 11: 13729

power supply designs, 11: 1274(R), 1964

radiation effects, 11: 7357

regulation of fields in Van de Graaff, 11: 725(J)

spiral sector, 11: 3185(J)

stabilization and control in magnetic proton resonance, 11: 10713(J)

Magnets (cont'd)

for sweeping charged particles out of bremsstrahlung beam, 11: 10329

testing Saclay synchrotron, 11: 8200(J)

Maize

radioinduced mutations, 11: 13239(J)

radiosensitivity of endosperm loci, effects of oxygen, 11: 4242(J)

Maleic acid, derivatives

decarboxylation, isotope effect in, 11: 2254(R)

with uranyl ions, influence of pH on composition, 11: 1839(J)

Mallinckrodt Chemical Works, St. Louis

progress reports, 11: 10831(R), 10832, 13055(R)

progress reports on SF materials accounting, 11: 9642(R)

progress reports on UF_4 production, 11: 7586(R), 9679(R), 9681(R), 9686(R), 9689(R), 9693(R), 12424(R)

Mallinckrodt Process

(Ether extraction process for the production of pure uranyl nitrate from uranium ores; see also Slurex Process.)

analytical control, 11: 12972

boron removal, 11: 10828, 12969

boron removal by coprecipitation with sodium diuranate, 11: 13011

brown oxide by-product recovery, 11: 9615

chemistry of column feed liquors, 11: 9652

continuous extraction methods, 11: 9648

ether extraction of uranyl nitrate hexahydrate, 11: 9634

extraction equipment changes to prevent emulsion formation, 11: 12396

feed preparation (calcium diuranate), 11: 13678, 13679

feed preparation and filtration, 11: 9647, 9649

feed preparation and Mo removal, 11: 10833

feed preparation of uranyl nitrate from black oxide, 11: 7582

feed preparation (pitchblende), 11: 10831(R), 10832(R), 10834, 13013

fuel preparation (pitchblende) and MoO_3 removal, 11: 9651

feed preparation (pitchblende) and solvent extraction, 11: 9650

feed preparation (sodium diuranate), 11: 10835, 12969, 13033

filtration, 11: 10832(R)

molybdenum removal, 11: 10834, 13016

molybdenum removal from solutions of $UO_2(NO_3)_2$ prepared from pitchblende, 11: 12326

nitric acid and calcium nitrate recovery from raffinates originating with pitchblende, distribution of B and Mo in, 11: 12327

phosphate removal, 11: 9583

phosphate removal from U ore, 11: 13681

radium removal, 11: 13013

raffinate processing factors in HNO_3 and $Ca(NO_3)_2$ recovery, 11: 12397

raffinates of, solubility of $CaSO_4$ in, 11: 8281

salting-out agents, 11: 13016

solvent extraction and Mo removal, 11: 10831(R)

solvent testing, 11: 11570

sulfate removal, 11: 12969, 13014

uranium content, effect of IN ether upon the U content of raffinate, 11: 12384

waste recovery, 11: 9629(R), 9635, 13035

Malonic acid, esters

complexing of Fe^{3+} with, prevention of Fe^{3+} co-precipitation with UO_4, 11: 6995(P)

Maltose

synthesis of C^{14}-labeled, 11: 7694(R)

Mammals

radiation injuries, effects of chemical and biological preparations, 11: 7923(J)

Man

effects of irradiation on body composition, influence of vitamin B and diet, 11: 5152(J)

hematological changes in, chronically exposed to low-level γ radiation, 11: 2235

maximum permissible internal dose of radionuclides, 11: 3306(J)

maximum permissible radiation exposure levels, 11: 4256(J)

normal radium content, 11: 67

radiation danger to the hereditary factor of, 11: 11860(J)

radiation dosage determinations, 11: 10191(J)

radiation effects on, review, 11: 55(J)

radioinduced injuries, 11: 9938(J), 9939(J), 9940(J), 9941(J)

radiometric analysis, 11: 4251(J), 4584(J), 9001(J)

radiometric analysis by external counting, 11: 7291(R)

radiometric analysis for β particles by Bremsstrahlung emission, 11: 9026(J)

radiometric analysis for γ activity, 11: 7268(J)

radiometric analysis for Ra content, 11: 11929

Man (standard)

radiation dosage determinations, 11: 2796

radiation effects, 11: 2238

Mandelic acid

solvent extraction to separate optical isomers, 11: 11703(R)

Manganates

(See also Permanganates.)

extinction measurements, reactions, and equilibriums in alkali hydroxide fusions, 11: 3332(J)

Manganese

activation determination in Al alloys, 11: 1776

activation for flux measurements in SAR, 11: 10286

determination by activation analysis in biological material, 11: 1779(J)

determination in homogeneous reactor solutions, 11: 4292(J), 10974

electrodeposition, 11: 7430(R), 9186(R)

energy levels in Mn II spectrum, 11: 13555(J)

Hall effect in, at room temperature with fields up to 30 kilo-oersteds, 11: 5342

ionization potential difference and variable valence, 11: 11071(J)

neutron cross sections, 11: 11739(R)

neutron reactions, 11: 10554

neutron reactions (n,γ), 11: 9752(R)

neutron total cross sections, 11: 10229

nuclear spallation by 170-Mev protons, 11: 6545

paramagnetic resonance spectrum of, in cubic MgO and CaF_2, 11: 5543(J)

reactivity effects in homogeneous thermal reactors, 11: 11760

tissue distribution and removal in rats, 11: 4781(R)

valence states determination, 11: 8285(R)

x-ray emission spectra in Geissler alloy within temperature range of magnetic transformation, 11: 1891(J)

Manganese alloys

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

Manganese–aluminum–cobalt alloys
See Aluminum–cobalt–manganese alloys.

Manganese–aluminum–titanium alloys
See Aluminum–manganese–titanium alloys.

Manganese–antimony alloys
See Antimony–manganese alloys.

Manganese–bismuth alloys
See Bismuth–manganese alloys.

Manganese bromides

free energy of formation and heat of solution, 11: 86(J)

Manganese chlorides

free energy of formation, 11: 86(J)

magnetic properties of $MgCl_2$, 11: 4016(R)

Manganese–cobalt alloys
See Cobalt–manganese alloys.

Manganese complexes

with nitrosonaphthol, formation constants, 11: 4301(J)

Manganese compounds

infrared absorption spectra of $Mn_2(CO)_{10}$ and structure, 11: 131(J)

reactions of $(C_5H_5)_3Mn_2(NO)_3$ with S, 11: 89(J)

Manganese–copper alloys
See Copper–manganese alloys.

Manganese ferrites

neutron diffraction analysis of $MnFe_2O_4$ at 4.2 and 300 K°, 11: 6267(J)

Manganese fluorides

antiferromagnetic resonance, 11: 4489(R), 12177(R)

antiferromagnetic resonance at low temperatures and higher frequencies, 11: 1383(R)

free energy of formation, 11: 86(J)

Manganese iodides

free energy of formation and heat of solution, 11: 86(J)

Manganese ions

crystalline cubic field splitting parameter in an S state, 11: 5387(J)

distribution in fused alkali hydroxides, 11: 3332(J)

hyperfine structure, 11: 6855(R)

magnetic properties, 11: 7455(R)

Manganese–iron alloys
See Iron–manganese alloys.

Manganese isotopes

abundance, upper limits, 11: 472(J)

formation during irradiation of stainless steel, 11: 10554

Manganese isotopes Mn^{52}

gamma emission from, anisotropy and polarization of, 11: 11483(J)

Manganese isotopes Mn^{53}

decay schemes, 11: 626(J), 5179(R)

formation in iron meteorites by cosmic radiation, 11: 4503(J)

half-life limit, 11: 9441

nuclear spin and magnetic moment, 11: 3040(J)

Manganese isotopes Mn^{54}

half life, 11: 1292(J)

isomeric state, search for, 11: 9139(J)

Manganese isotopes Mn^{55}

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

Manganese isotopes Mn^{55}

electrodisintegration, 11: 6111(J)

energy levels, 11: 1542(R), 12186(R)

energy levels from proton scattering data, 11: 9186(R)

hyperfine structure, 11: 10268(J)

neutron total cross sections and resonances in kev region, 11: 6065(J)

proton reactions (p,n), 11: 2026(R), 4710(J), 6863(R)

proton reactions (p,n), resonances in, 11: 10231(R)

Manganese isotopes Mn^{56}

energy levels, 11: 1542(R)

separation of trace amounts from reactor effluent water, 11: 11121

Manganese oxide–aluminum oxide–silicon oxide systems
See Aluminum oxide–manganese oxide–silicon oxide systems.

Manganese oxides

adsorptive properties for Ba, Te, and Zr, 11: 7520

centrifugation, in the Thorex Process, 11: 13672

coprecipitation with Pa, 11: 1001(J)

magnetic ordering in Mn_2O_3, 11: 9189(R)

neutron scattering distribution for paramagnetic, 11: 2027(R)

solubility, effect of acid concentration, 11: 13672

Manganese steel

microstructure, and mechanical properties, 11: 1906(J)

for nuclear applications, 11: 1906(J), 13516(J)

Manganese sulfides

magnetic structures of polymorphic forms, 11: 2017(J)

Manganese–titanium alloys

corrosion by fuming HNO_3, 11: 273(R), 1075(R)

drawing, effect of die angle, speed, % reduction, and lubrication on forces in, 11: 11225

fatigue, effect of microstructure and interstitial elements on, 11: 5347

hydrogen embrittlement, 11: 4457(R)

phase transition from β into ω and α, kinetics, 11: 12060(J)

photomicrographs, 11: 6739

physical and mechanical properties, 11: 11195

stress corrosion cracking in HNO_3 solutions, 11: 274

tensile properties, effect of O, N, and C contaminants, 11: 1138(R)

tensile strength at 650°C, 11: 7626(R)

uniformity of commercial ingots, 11: 13347

Manganese–uranium alloys

magnetic susceptibility and hysteresis at 4.2°K, 11: 12738

Mannitol

complexes with ferric, germanic, and zirconic acids, 11: 11064(J)

oxidation in AAA (pitchblende) ore solutions, 11: 10834

Manometers

(See also Pressure gages; Vacuum gages.)

automatic reader for, 11: 7251(J)

performance for measuring low vapor pressures, 11: 12072(J)

pressure, relation to pressure at mouth of pitot tube, 11: 2426

slurry flow measurements using, 11: 9828

Manuals

(See Handbooks and manuals.)

Marquardt Aircraft Co., Van Nuys, Calif.

progress reports on ceramic and cermet materials, 11: 1515(R)

Mark I Naval Reactor
See Submarine Thermal Reactor (Mark I).

Mark II Naval Reactor
See Submarine Thermal Reactor (Mark II).

Mark A Naval Reactor
See Submarine Intermediate Reactor.

Mark B Naval Reactor
See Submarine Intermediate Reactor.

Martensites

formation without diffusion, mechanics and kinetics of, 11: 1529(J)

Marysvale Area (Utah)

exploration, geology, relationship of U mineralization and rhyolite in, 11: 10539

Mass spectrography

applications in study of phase changes of metals of low volatility, 11: 1471

broad peaks of carbon monoxide and dioxide, methyline iodide and bromide, acetylene and ethylene, investigation, 11: 2201(J)

history of isotope separation by, and latest machine at Harwell, 11: 7255(J)

ion detection by photographic means, 11: 8236(J)

ionization efficiency curves and statistical theory, 11: 5956(J)

metastable transitions and collision-induced dissociations, 11: 4559(J)

precision of two proposed methods, 11: 11735

proceedings of conference at Harwell, September, 1955, 11: 1569(J)

review of work at Argonne, 11: 6863(R)

sample requirement estimate, 11: 13848

Mass spectrometers

(See also Calutrons; Electromagnetic separation; Ion sources; Isotrons; Cyclorators; Line recorders; Trochotrons.)

analysis of Li, K, Ru with synthetic aluminosilicate ion source, 11: 1230(J)

automatic recording system for, 11: 7706

auxiliaries, 11: 10813(R)

circuits for r-f, design, 11: 4184

Consolidated Model 21-221 and General Electric Nier-type 60°, comparison of consumption rates of UF_6 in, 11: 12514

cyclotron resonance applied to design, 11: 5426(J)

design and operation for heavy element separations, 11: 6452(J)

design and performance for gas analysis, 11: 10907

design and performance for U isotope analysis, 11: 13849

design and performance of three-stage, 11: 11728(R), 12504(R), 13834(R)

design and use for U^{235} assay, 11: 13030

design for determination of D in H_2, 11: 9381(J)

design for isotopic analysis of Li, 11: 1570

design for isotope analysis of process gas streams, 11: 8995

design of high resolving power, for analytical studies of light materials, 11: 12132(J)

design of high-sensitivity, for noble gas analysis, 11: 3943(J)

design of ion source for, for use with vacuum lock, 11: 12800

design of line reactor type, for isotope analysis, 11: 8998

design of three-stage radio frequency, 11: 12130(J)

electrical high-frequency, theory of, 11: 9382(J)

focusing properties of symmetric magnetic fields in, 11: 12131(J)

high-sensitivity, with stigmatic direction focusing, 11: 7256(J)

image curvature caused by fringing fields in magnetic sector, 11: 1574

Mass spectrometers (cont'd)

image defects of double focusing, 11: 5948(J), 11314(J)

ion detection with scintillation detector in, 11: 2970(J)

ion mass measurements by impulse method, 11: 12801(J)

ion source bead fabrication, 11: 10630

ion source for fission products in Ge, Sb, Te, and Sn, 11: 11698

ion sources, 11: 3935(R)

isotopic ratio determination by ion beam intensity measurements, 11: 2584

leak detector design using, 11: 468(J)

magnetic and electric field distribution effect on radiofrequency, 11: 1572

mathematical treatment of analyzer, 11: 1571

operation of 3-stage, 11: 9772(R)

pulse method of magnetization of Idaho CPP, 11: 9380

radiofrequency, developed for trace detection, 11: 4184

radiofrequency, for light and inert gas analysis, 11: 6454(J)

resolution of complex ions in, 11: 9771(R)

thermal transpiration in, inlet system, 11: 1573

triple stage r-f, performance, 11: 8078(J)

Mass transfer

in carbon steel loop, effect of radiation on crud deposition, 11: 11187

in liquid metal systems, 11: 7186(J)

review, 11: 5373

by water through a sphere bed of benzoic acid, 11: 8543(R)

Massachusetts Inst. of Tech., Cambridge

progress reports, 11: 8495(R), 11690(R), 13358(R)

Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy

progress reports, 11: 3414(R), 4861(R), 6237(R)

progress reports on imperfections in hexagonal cobalt, 11: 12093(R)

Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science

progress report, 11: 1542(R), 5365(R), 9186(R), 12186(R)

Massachusetts Inst. of Tech., Cambridge. Metallurgical Project

progress reports, 11: 7681(R), 8515(R), 8516(R), 8517(R), 8518(R), 8519(R), 8520(R), 12426(R), 13804(R), 13805(R)

progress reports of Brookhaven work being carried out at M. I. T., 11: 8521(R)

Massachusetts Inst. of Tech., Cambridge. Radioactivity Center

progress reports, 11: 5179(R), 12639(R)

Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics

progress reports, 11: 1920(R), 5369(R), 8025(R)

Massachusetts Inst. of Tech., Cambridge. Solid-State and Molecular Theory Group

progress reports, 11: 538(R), 4490(R), 6855(R), 11254(R)

Massachusetts Inst. of Tech., Watertown, Mass. Mineral Engineering Lab.

progress reports on domestic ores, 11: 7537(R), 7538(R), 12385(R)

Materials accounting

See SF Materials accounting.

Materials testing

(See also Mechanics; Metallurgy.)

aircraft structural, at high temperatures, 11: 1506

automatic flow detector for, 11: 13050

bibliography of creep for structural engineers, 11: 255

brittle strength, statistical theory, 11: 388(J)

eddy-current, of zircaloy tubing, 11: 1054

by eddy-current methods, 11: 2893(J), 5847(J)

Materials testing (cont'd)

eddy-current methods for tubing of low-conductivity alloy, 11: 12456(R)

electromagnetic test for U quality, 11: 10893

fabrication of defective fuel elements as standard for calibration of nondestructive test equipment, 11: 13314

inspection of PWR fuel rod closures with radiography, eddy currents, ultrasonics, and fluorescent penetrants, 11: 11749

internal-probe eddy-current tubing inspection device, 11: 12898(R)

irradiation and corrosion studies on separation process materials, 11: 8440

for jet applications, 11: 307

laboratory simulation of thermal effects in fuel elements, 11: 13727

loading, methods of measurement, 11: 5846

of mechanical properties of special materials, 11: 12737

of metals, applications of nuclear irradiation and radioisotopes, 11: 1535

methods for determining creep properties under compressive bearing and shear type of loading, 11: 10519

methods of in-pile, 11: 4161

micro-indentation hardness tests, size effect, 11: 6342

nondestructive, mechanization of, 11: 11670

nondestructive, radiographic and eddy current techniques, 11: 12057

nondestructive testing, sensitivity, advantages, disadvantages, limitations, and techniques, 11: 1056(J)

procedures for uniform evaluation, 11: 8901

for radiation effects, 11: 10781

reactor, 11: 3256(P), 5902(J)

in relation to component behavior, conference, 11: 12020

research in, 11: 253

shock loads, testing equipment for, 11: 1507

subsurface crack detectors using eddy current changes, design and performance, 11: 7699

test section fabrication, use of tooling plastics, 11: 12724

testing facilities for the determination of physical and mechanical properties of metals, 11: 10518

ultrasonic scanner for, 11: 5412(J)

ultrasonic scanning and recording system, 11: 11173(J)

Materials Testing Accelerator targets

coolant radioactivity induced by deuterons and neutrons, 11: 11819

design, 11: 8545, 8566, 10996(R)

design and development, 11: 13197(R), 13837(R)

design and handling, 11: 14020(R)

design and performance, 11: 14021

design considerations for water-cooled clad uranium plate, 11: 9882

design for U^{233} production, 11: 13196

design of helium-cooled flat-plate uranium, 11: 13194

dissolution of Zr-clad U, 11: 11643

development, 11: 8549(R)

effect of corrosion and irradiation on, 11: 8547(R)

effect of NaK cooling on neutron production in, 11: 10996(R)

effects of coolant on neutron production in, 11: 14018

expected heat loads in Th-fueled, graphite-moderated, 11: 10995

fabrication, 11: 13838(R)

fission ratios and breeding in, calculation, 11: 9884

fission ratios and breeding in hollow, two-group approximation of, 11: 10998

Materials Testing Accelerator targets (cont'd)
flux in a rectangular cavity, calculation of, 11: 9874
gas cooling, 11: 11817
heat conduction equations for, 11: 8438
heat generation by deuteron bombardment, 11: 10996(R)
hydrodynamic properties, 11: 8545
isotopic composition, 11: 10996(R)
multiplication factor, calculation of, 11: 9883
neutron flux and escape in cylindrical, 11: 13829
neutron flux distribution in, containing water ducts, 11: 10996(R)
neutron performance analysis of, by group neutron diffusion theory, 11: 14020(R)
neutron production, 11: 14018
neutron production in, by deuterons, 11: 8565, 13826
neutron production in U–H_2O, effects of reflector material and lattice thickness on, 11: 9881
neutron yields from solid U, 11: 13828
particle scattering in, deuteron, neutron, and proton, 11: 9887(R)
reflectors for, evaluation of materials, 11: 8728
thermal stress calculations for U (Zr clad), 11: 7879
thermal stresses in, subjected to rapid heating, 11: 7867
three-group equations, 11: 13187
two-group approximation to absorbing water-cooled graphite-moderated, 11: 10997
yield studies at high energy, 11: 8568(R)
Materials Testing Accelerators
arc cathode design, 11: 2744
beam control methods, 11: 8696(R)
beam focusing, 11: 7876(R), 9887(R)
beam profile studies, 11: 7878
beams, 11: 8730(R), 9886(R)
characteristics of A-12 and A-24, comparison, 11: 8734
cost factors of 50- and 100-Mc, 11: 12619(R)
design, 11: 8730(R), 9886(R), 13197(R), 13838(R)
design and development, 11: 13113(R), 13837(R)
design of 50-Mc, 11: 7876(R)
design of high-frequency A54, 11: 7877
development, 11: 4136(R), 7850(R), 12620
development of auxiliaries for, 11: 7869(R)
drift tubes, investigation of cracks in Inconel, 11: 8544
facilities for, design and cost, 11: 13195
gap splitter radiofrequency power loss, calculations, 11: 14022
high-current r-f proton injector for, operation and performance, 11: 7872
ion source design, 11: 7876(R)
instrumentation, 11: 7876(R)
magnets, determination of characteristics of, 11: 14023
neutron flux distribution, 11: 9885
oscillator tube testing, 11: 9887(R)
radiofrequency systems, 11: 8730(R), 9886(R)
target power recovery, 11: 10996(R)
vacuum vessel, heat generation and thermal stresses, 11: 8732
Materials Testing Accelerators (Mark I)
beam current monitoring in, with torroidal transformers, 11: 12619(R)
Materials Testing Accelerators (Mark I) (cont'd)
beam current vs. injection energy, 11: 7876(R)
beam dynamics and focusing, 11: 12619(R)
beam studies, 11: 8735(R), 14020(R)
damage in front-end gaps of, prevention, 11: 7869(R)
design, operation, and performance, 11: 7870, 9880(R), 12619(R)
electric field distribution and drift-tube design, 11: 7875
electric field measurements in, 11: 8731
electric field measurements in, by "glo-ball" method, 11: 7874
focusing magnets for, design and performance, 11: 7873
neutron production vs. injection energy, 11: 7876(R)
operation, 11: 14019
operation and performance, initial run, 11: 13192
operation and performance during run No. 5, 11: 12616
operation and performance during run No. 6, 11: 7871
operation and performance during run No. 7, 11: 12617
operation and performance during run No. 8, 11: 14017
operation and performance during run No. 9, 11: 13193
operation and performance during run No. 10, 11: 7876(R), 12618
operational performance, 7869(R), 8730(R)
radiofrequency system design, 11: 7876(R), 12621
shielding, life expectancy of elastomer gaskets in, 11: 8744
stability as a closed loop system, 11: 3588
Materials Testing Accelerators (Mark II)
beams, perturbing effects on operation, 11: 10999
design of pre-accelerator for bunched injection, 11: 717
radiofrequency systems for stable beam rotating around a central conductor, 11: 717
shielding calculations, 11: 8733
Materials Testing Accelerators (Mark III)
beams, electromagnetic methods for confining, 11: 7880
design and cost factors, 11: 11816
Materials Testing Reactor
building design, 11: 5564, 5565, 5566
capital and operating costs, 11: 7743
coffins and coffin handling, 11: 5562
construction, 11: 5563
control rods, 11: 7774
control system, design, 11: 641
coolant contamination, 11: 4685(R)
coolant monitoring, 11: 7745
cooling system, 11: 2431, 2690, 6531
core design critical constants, 11: 8674
criticality studies and reactivity, 11: 2689, 8677(R)
curium isotope impurity in Be shim rod, 11: 1328
design and operation, 11: 591(J)
design of air cooling system for, 11: 7719(R)
design of graphite pebble system, 11: 638
design and operation of Argonne high-pressure water loop, 11: 6104(J)
effect of cycle time of, with 20% enriched fuel due to changes in metal/H_2O volume ratio, 11: 13145
effect of uneven fuel burnup on maximum heat flux, 11: 13923
equations for burnup apportionment, 11: 13146

Materials Testing Reactor (cont'd)

experimental facilities, examination for PWR progressive failure tests, 11: 14004

experimental facilities for proof testing CVR and PWR fuel subassemblies, 11: 13839

facilities for irradiation, 11: 13988

fast neutron flux spectrum, 11: 7828

flux levels, feasibility of increasing, 11: 10975

fuel assemblies, dimensional specifications, 11: 2507

fuel assembly development, 11: 7827

fuel element fabrication, 11: 7774, 8677(R)

fuel assembly hydraulic testing, 11: 9052(R)

fuel assembly processing for Ba^{140}, 11: 7556, 13206

fuel consumption determination by gamma scanning, 11: 12515

fuel consumption rate, 11: 2690, 8332

fuel element corrosion and dimensional stability in, 11:14003

fuel element deformation in static pressure tests, 11: 2660

fuel element design, 11: 8675, 10975

fuel element dissolver solutions for, particle settling rates in, 11: 11624

fuel element fabrication for critical experiment, feasibility, 11: 7746

fuel element failure, effects of coolant flow, pressure, and temperature, 11: 2445

fuel element non-destructive assay data for, statistical analysis of, 11: 8676

fuel element processing, activity calculations during, 11: 11611

fuel element shipping, criticality studies for, 11: 13830

fuel element studies, 11: 7786

fuel element testing, 11: 12888(R)

fuel element testing, hydraulic, 11: 1276(R), 2694

fuel loadings for 600 Mwd operation, 11: 13925

fuel plate clad thickness, design of eddy current device for measuring, 11: 4538

fuel plate deformation, 11: 4685(R)

fuel recovery by solvent extraction with TBP, 11: 9660

gamma irradiation facility, 11: 13430(R)

graphite for reflector, 11: 640

heat transfer, 11: 8677(R)

heat transfer, calculated surface temperatures for nuclear systems and analysis of uncertainties, 11: 11412

in-pile loop design for corrosion and radiation effects study, 11: 9875

instrumentation testing, 11: 1658

irradiation of fissionable material in, design of equipment for, 11: 7819

loading calculations, 11: 13430(R)

low-temperature irradiation facility, feasibility and liquid-nitrogen requirements for, 11: 2692

manual of pre-operational acceptance test procedures for all parts enclosed within the reactor tanks, 11: 1658

matrices, 11: 2445

neutron flux distribution, 11: 7826(R), 12888(R), 13495

neutron flux distribution, effects of Cd insertions, 11: 9052(R)

neutron flux distribution and heat generation, 11: 7748

neutron flux distribution for high fuel concentrations, 11: 13170

neutron flux measurements, 11: 1276(R), 2638, 2691

nuclear constants, 11: 7826(R)

Materials Testing Reactor (cont'd)

nuclear properties of, with Geneva fuel loading, 11: 13927

neutron spectrum of, long-wave, 11: 6927(J)

operating procedures, improvements in, 11: 7827

power level following scram, permissible maximum, 11: 13924

reactivity, effect of cooling water impurities on, 11: 8673

reactivity effects of Xe^{135} and Sm^{149} on, with U^{235} and Pu^{239} fuels, 11: 13496

reactivity of, 11: 7826(R), 8675

reflector cooling air, design of passages for, 11: 639

reflector support structures, 11: 4078

safety during operation at 40 MW, 11: 12889

saw design for cutting fuel elements under water, 11: 3379

shield survey, 11: 7744

shielding design, 11: 7719(R)

shim rod modifications, 11: 13430(R)

shim rods in, economic use of, 11: 12573

shutdown, permissible power following junior scram, 11: 13924

thermal neutron flux depression by absorbers in experimental holes, 11: 653

use of spent fuel elements as gamma sources, 11: 6105(J)

variation of fuel requirements for fixed operating cycles, 11: 13144

vertical hydraulic rabbit, evaluation as irradiation facility, 11: 14006

water flow and pressures in, 11: 2445, 7747

Materials Testing Reactor Mockup

boiling, effect of power level on, 11: 2726

control rods for, reversing time, 11: 13148

coolant fission product activity, source of, 11: 6076

cooling system, identification, source, and control of radionuclides in, 11: 9479

cost estimates, 11: 8705(R)

design, 11: 9837

design, development, and construction, 11: 8705(R)

design and development, 11: 13597(R)

design and operation, 11: 591(J), 1327, 5035(J)

experimental facilities and procedure for rocking bomb corrosion testing, 11: 10530

fission product heating after shutdown, 11: 9864

fuel assembly of, vibrations in, 11: 7854

fuel element design and fabrication, 11: 9862

fuel element flux traverses, 11: 7860

neutron flux distribution and heat generation of, and extrapolation to MTR design, 11: 7748

operation in 1955, 11: 7860

production of heavy isotopes in, 11: 7742

proposal for operation at higher power level, 11: 13895

reactivity, effect on neutron production, 11: 2726

Mathematical tables

angular distribution data, tables for transformation from laboratory system to center-of-mass system, 11: 9386

charged particle penetrabilities, 11: 10633

of classical orbital integrals in Coulomb excitation, 11: 3011(J)

for computing bivariate normal probabilities, 11: 4932(J)

Mathematical tables (cont'd)

for computing radiation dosage, 11: 11902(J)

of normal probability integral, 11: 7257

of radial Coulomb integrals (m,n,l), 11: 7258

table of $\Gamma(\tau)$ used in inhour formular for calculating reactivity, 11: 10639

vector-addition coefficients for $j_2 = {}^5/_2$, algebraic, 11: 10644(J)

for x-ray-diffraction studies, 11: 478

Mathematics

(See also Biometry; Computers; Constants and conversion factors; Differential equations; Fourier transforms; Harmonic analysis; Mathematical tables; Perturbation theory; Statistics.)

accuracy in calculating arithmetical problems, 11: 6462

application of Monte Carlo method to solution of the potential equation, 11: 12135

applications in nuclear technology at Oak Ridge National Lab., 11: 13851(R)

applications of Liapounov's Second Method to reactor dynamics, 11: 12138(J)

bibliography of Russian books, 11: 10169(J)

bivariate normal probability distribution, 11: 6461

Boolean Algebra analysis of binary counters, 11: 13380

computational errors, 11: 11839

computers for use in, book, 11: 6465

determination of reactor transfer functions, 11: 11316

equation for isotopic exchange between a semi-infinite solid and a well stirred solution, 11: 1578(J)

equations for the conditions of plasticity, 11: 6464

error function, ϕ, new shorter method for use in conduction, diffusion and neutron reactor physics, 11: 2592

extrapolation techniques for real symmetric matrices, 11: 7260

Fourier transform integrals, numerical quadrature, 11: 480(J)

function generators in, circuits for, 11: 12146(J)

Gauss's theory of least squares, English translation, 11: 13386(J)

of high-speed computers, 11: 10160(R), 10161(R)

Hill and Mathieu equations, solutions, 11: 12134

limit theorems for conditional distributions, 11: 10170(J)

LOGIC, a flux data processing code for IBM-650, 11: 12806

matrix methods in neutron diffusion problems, 11: 12840

methods of applied, 11: 3880(J)

methods of improving precision of inverse square measurements, 11: 12133

monograph on the theory of characteristics of fluid flow, 11: 11168(J)

Monte Carlo method, multidimensional integrals in, 11: 12137(J)

neutron transport equation, numerical solutions for time-dependent, 11: 5430

non-linear deflections of shallow spherical shells under uniform external pressure, 11: 5429

numerical evaluation of integrals and expectation of a function of a normally distributed random variable, 11: 2585

perturbation formulae for Mathieu equation, 11: 5959

radiation fluxes in cylindrical cavity from an idealized entering current, 11: 4931

reducing computational errors, procedures for, 11: 8990

reliability estimates of lots of equipment or components, 11: 5957

reliability formulas for complex mechanisms, 11: 6800

reliability studies of systems in which component reliabilities vary with environment, 11: 2589

Mathematics (cont'd)

renormalization of S matrix, non-relativistic, 11: 806(J)

research problems, descriptions, 11: 479(R)

second rank spinors with invariant components and spinor formalism including, 11: 10643(J)

slide rule design and construction for computing solid angles, 11: 12803

solid angle calculations for right circular cylinders, 11: 6458

solid angle contour integrals, series, and tables, 11: 5435(J)

solution of a Fredholm integral equation, 11: 2973

solution of elliptic difference equations, iterative methods, 11: 11317

solution of Hill equation for FFAG accelerator use, 11: 3178

solution of integral equations by continued fractions, 11: 1237(J)

solution of partial difference equations, generated error in, 11: 2972

spherical-harmonics method for neutron-transport problems in cylindrical geometry, 11: 7287(J)

statistical mechanics of the steady state, 11: 9179(J)

subordination in complex variable theory and theorem on minimal surfaces, 11: 5958

temperature distribution in spherical pellets, 11: 9758

theorem of symmetric switching functions, 11: 8025(R)

theory of applied, 11: 1236(J)

theory of time-lag, retarded control, and hereditary processes, 11: 11318

time and space temperature distribution in a sphere with an intermittent constant heat source, 11: 12011

transport equations, formulation and analysis of numerical methods for, 11: 4563

two-group diffusion equations in x-y geometry for heterogeneous reactor, 11: 2123

uses in process control, review, 11: 5433(J)

variational approximation methods applied to theory of atomic collisions and reactor physics, 11: 8994(J)

zeros of Bessel functions, analysis of, 11: 2591

Matrices

See Reactor matrices.

Mayoworth Area (Wyo.)

stratigraphy and U distribution, 11: 3830(J)

Mechanical engineering

problems in reactor construction, 11: 11438(J)

research, stimulation by atomic industry, 11: 11439(J)

Mechanics

(See also Materials testing; Quantum mechanics; Stress analysis; Structures.)

buckling of shallow spherical shells under external pressure, 11: 6420

deflection equations for various loadings of circular-arc curved beams, 11: 6798

equations for the conditions of plasticity, 11: 6464

experiments and calculations, 11: 1236(J)

fluid motion in "U" tubes, 11: 9705

reliability formulas for complex mechanisms, 11: 6800

of shells and shell-like structures, bibliographies, 11: 10511

shock analysis for an elastic system on a rigid foundation, 11: 2547

statistical, of the steady state, 11: 9179(J)

Mechanisms

See Reaction mechanisms.

Medical Coll. of Virginia, Richmond

progress reports on radioinduced tissue protein changes, 11: 11022(R)

Melting

equipment for consumable-electrode arc, of Th powders, 11: 4887

separation of U from fission products by zone, 11: 6182(J)

Melting point apparatus

design of drip-melting, 11: 8517(R)

Membrane filters

application in radiosensitivity studies of bacterial spores, 11: 9976(J)

for gravimetric analysis of radioactive precipitates, 11: 6681

particle collection efficiency, 11: 226

Membranes

(See also Films.)

anion exchange, ion motion near polarized surface, 11: 3767

cation-exchange resin, distribution and behavior of water in, 11: 13295(J)

cellophane with $BaSO_4$ precipitated in it, high membrane potential, 11: 5192(J)

diffusion of rare gases by thermo-osmosis through rubber, 11: 8970(J)

ion-exchange, electrochemical utilization, 11: 11648

life tests, effect of stainless corrosion products, 11: 177(R)

Memory devices

automatic coding in programming language translations, 11: 9374(J)

automatic translator on electronic calculating machine, 11: 1971(J)

design and testing of ferrite core, 11: 4544(R)

design of electrostatic, 11: 9568(P)

design of two-dimensional ferrite-core, 11: 9396(J)

design with 10 memory units, 11: 6456

improved cathode ray tube, 11: 3264(P)

problems of machine translation, 11: 3932(J)

system for simultaneous memory recall, 11: 12805

Mercaptans

See Thiols.

Mercapto group

chemical determination, micro methods, 11: 8258(R)

metabolism in yeast, 11: 12642(R)

prophylactic use against radiation injuries, 11: 882(J), 2799(J), 4254(J), 6208, 6285(J)

protective effects on irradiated pyrimidines, 11: 4332

radiosensitivity effects, 11: 7923(J)

tissue content, effects of dietary sulfur amino acids in mice, 11: 2799(J)

Merchant vessels

design of first nuclear powered, 11: 12901

design of homogeneous reactor for propulsion of, 11: 11765

nuclear power plants for, feasibility of, 11: 13978, 13979(R)

nuclear powered, development, 11: 2775(J), 3646(R)

power plant design for first nuclear powered, 11: 12901

Mercury

adsorptive properties for gaseous $C_2H_5OH-C_7H_{16}$ mixtures, 11: 1010(J)

amperometric determination, 11: 12973(R)

atomic structure, x-ray investigation of, 11: 1150(J)

attack on unstressed metals by liquid, 11: 5313(J)

characteristics of boiling, 11: 5836(R)

chemical properties, tracer study, 11: 10428(R)

constricted discharge characteristics, theory, 11: 10135

cooling properties for fast reactors, 11: 8682

Mercury (cont'd)

determination in air, 11: 8827(J)

determination in aqueous solution, 11: 2826

diffusion in Ag, 11: 3425(R)

flow characteristics of jets of, through water, 11: 8576

handling, 11: 13252

heat transfer in condensation of vapor up to atmospheric pressure, 11: 6707(J)

heat transfer rates to crossflowing in a staggered tube bank, 11: 6709(J)

hyperfine structure, investigation, 11: 1920(R), 3941(J)

gamma reactions (γ,n), 11: 704(J)

neutron elastic scattering in, at 14 Mev, 11: 1642

neutron reactions (n,γ), 11: 10229

poisoning following chronic exposure, 11: 894

polarographic–amperometric determination, 11: 9234(J)

solvent extraction from aqueous solutions, effects of concentration on, 11: 6686(J)

spectrum, isotope shifts, 11: 6167(J)

titrimetric determination, 11: 114(J)

toxicology, 11: 4260, 13252

toxicology, bibliography, 11: 12656

vacuum properties for large diffusion pumps, 11: 1060

vapor, control in laboratories, 11: 6632

vapor detector calibration, 11: 6664

vapor jet for stripping electrons from heavy ion beams, 11: 4906(J)

Mercury alloys

amalgams, reduction by dry salt of cold-pressed annealed, evaluation, 11: 7653

reduction from salts dissolved in PTA of cold-pressed annealed, evaluation, 11: 7653

Mercury complexes

stability with thiocyanate cations, 11: 9587(R)

Mercury electrodes

current anomalies, interferometric analysis, 11: 13381(J)

electro-capillary valve for use as dropping-, 11: 5186

flow of electrolytes during reduction at, 11: 11063(J)

Mercury ions

polymerization in aqueous solutions, 11: 6686(J)

Mercury isotopes

Coulomb excitation, 11: 573(J)

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

enrichment of radioactive, 11: 1974(J)

photochemical separation, 11: 3941(J)

preparation by Hg photosensitization, 11: 3942(J)

separation, baffle cooling system for, 11: 2582

separation by cascade evaporation, 11: 13108

separation by photoexcitation, 11: 13844

Mercury isotopes Hg^{189}

preparation by heavy ion bombardment of Ta, 11: 9076(J)

Mercury isotopes Hg^{193}

conversion spectra at high energy, 11: 796(J)

Mercury isotopes Hg^{195}

conversion spectra at high energy, 11: 796(J)

Mercury isotopes Hg^{197}

conversion electrons, limitations of angular correlation, 11: 617(J)

decay, effects of extranuclear fields on angular correlation measurements in, 11: 4991(J)

magnetic dipole moment and isotope shift, 11: 13358(R)

Mercury isotopes Hg^{198}

decay schemes, 11: 6863(R)

internal conversion, 11: 1697(J)

Mercury isotopes Hg^{199}

hyperfine structure coupling constant of the $6s6p\,P_1$ level, 11: 11388(J)

resonant scattering of γ rays in, and mean life of 209-kev level, 11: 4998(J)

thermal neutron capture by, soft γ rays from, 11: 10757(J)

Mercury isotopes Hg^{200}

energy levels studied by decay of Tl^{200}, 11: 6516

Mercury isotopes Hg^{202}

coherence time measurement by magnetic resonance vs. magnetic depolarization, 11: 9175(J)

Mercury isotopes Hg^{203}

correlation coefficients and spins, 11: 10266(J)

decay schemes, 11: 627(J), 772(J), 1252(J)

Mercury–lithium alloys
See Lithium–mercury alloys.

Mercury nitrates

reaction with hydroxyl ions, 11: 1013

Mercury–sodium alloys

temperatures produced in preparation, 11: 13864(R)

Mercury–thallium alloys (liquid)

atomic structure, x-ray investigation of, 11: 1150(J)

Mercury–thorium alloys

cold pressing and reduction to Th by retorting, 11: 11696

hot pressing and phase equilibria, 11: 8352(R)

preparation by reduction of $ThCl_4$ with Hg, 11: 11696, 12993(R)

Mercury–uranium alloys

preparation and distillation in Hermex Process, 11: 10820(R)

Mesic atoms

collisional de-excitation of μ mesic atoms, 11: 13402(J)

meson and nuclear properties from analysis of, review, 11: 7282(J)

nuclear polarization and ebb and flow effect in μ, 11: 6853(J)

properties, review of information on, 11: 7300(J)

review of special properties of, 11: 5999(J)

Meson beams

production and properties of, in Bevatron, 11: 1357(R)

production of low-energy, in cyclotrons, 11: 12283(J)

Meson decay

breakdown of parity conservation in π-μ-e, 11: 8121(J)

composite model for new unstable particles, 11: 7284(J)

heavy neutral K, 11: 9033(J)

identification curves for heavy-, 11: 1611

modes of τ and χ mesons, 11: 3996(J)

negative τ', 11: 8101(J)

observed in 10-in. liquid H_2 bubble chamber, 11: 1610

parity conservation in, theory, 11: 579(J)

pi, explanations in frame of universal Fermi interaction, 11: 9034(J)

rates of heavy, 11: 8102(J)

Meson scattering cross sections

calculation for $T = \frac{3}{2}$ state, 11: 2002(J)

Meson showers

production by heavy primary particles, 11: 8949(J)

Meson spectra

momentum, determined at depth of 40 m water equivalent, 11: 1934(J)

Meson theory
See Nuclear theory.

Mesons

(See also Cosmic mesons; Photomesons; S particles.)

angular distribution, 11: 2993, 3990(J)

charge distribution of, in nucleon-antinucleon annihilation, 11: 4031(J)

Cosmotron studies, 11: 9188(R)

decay processes, 11: 2013(J), 3986(J), 5504(J), 6579

decay schemes, isotopic spin selection rule $/\Delta I/ = \frac{1}{2}$ for strange particles, 11: 11338(J)

disintegration of unknown, 11: 5485(J)

field theory, dispersion relations in, 11: 9027

fields, chain systems in, mathematical analysis, 11: 2994(J)

fixed source theory, dispersion relations for, 11: 2008(J), 2009(J)

formation in p-d and p-p reactions, 11: 6493

heavy neutral, possibility of, 11: 10221(J)

high-energy kinematics of, data on, 11: 6867

history and development of study of light and heavy, 11: 15(J)

integral quadratic equations between elements of collision matrix T, 11: 13399(J)

interaction coupling constants, restrictions on, 11: 4191(J)

interactions with baryons, theory, 11: 6977(J)

interactions with hyperons and nucleons, symmetry operations of Hilbert space and selection rules, 11: 12164(J)

lifetime of positive heavy, 11: 9030(J)

lifetimes of heavy, 11: 2997(J)

long-lived neutral, observation in pellicle stacks, 11: 530(J)

masses, review of data, 11: 6843(J)

masses of positive heavy, 11: 4595(J)

multiple production, 11: 2948(J), 4602(J)

multiple production, quantum statistics of fields and, 11: 9029(J)

multiple production at extremely high energy, models, 11: 9040(J)

multiple production in cosmic radiation, 11: 8951(J)

multiple production of, by viscous fluid model, 11: 10203(J)

multiple production of, hydrodynamical model, 11: 3625(J)

nuclear interactions of long-lived neutral strange particles, 11: 10211(J)

nuclear scattering in low-energy region, 11: 7283(J)

nucleon coupling constant, classical calculation, 11: 9057(J)

nucleon scattering by, 11: 2214(J), 6564(J)

and nucleon structure, 11: 6874(J)

parity conservation in decay of π^+ and μ^+, 11: 4972(J)

parity conservation in π-μ-e decay, 11: 6847(J)

parity doublet theory of, coherence effects, 11: 3626(J)

photoproduction, 11: 3627(J), 5477(J), 6576(J)

photoproduction from nucleons and deuterons, transition amplitudes for, 11: 12825(J)

present knowledge on, survey, 11: 8108(J)

production, properties, and interactions, conferences on, 11: 6506(J)

production by cosmic rays in Pb, Cu, and C nuclei, 11: 1939(J)

production by electrons, differential cross section, 11: 531(J)

Mesons (cont'd)

production by meson-nucleon collisions in Heisenberg representation, 11: 10202(J)

production by nucleons, Moscow conference on theory of, 11: 6181(J)

production by photons, relativistic dispersion relation approach, 11: 10220(J)

production by 660-Mev protons in photographic emulsion, 11: 3990(J)

production in collisions of high-energy nucleons, 11: 2170(J), 3003(J)

production in Cosmotron and γ rays from, 11: 1261(J)

production in deuterium by 1.4-Bev pions, 11: 1614(J)

production in high energy nucleon-nucleus collisions, hydrodynamic treatment of multiple, 11: 13409(J)

production in meson-deuteron reactions, 11: 2012(J), 13404(J)

production in n-p collisions at Cosmotron energies, 11: 5476(J)

production in p-p collisions, isobar model for, 11: 6850(J)

production in two-nucleon collisions, 11: 2012(J)

production of a supplementary meson by, equation for matrix, 11: 13398(J)

production of heavy, by π^- mesons of 4.5 Bev/c, 11: 9035(J)

production theory, the Tamm-Dancoff approximation, 11: 2010(J)

production via secondary pions by proton bombardment of deuterium, 11: 8198(J)

properties of heavy, and hyperons, analysis, 11: 9428(J)

reaction with C^{12} to produce three α particles, 11: 2150(J)

research on, review, 11: 1940(J)

scattering amplitude equation, 11: 2015(J)

scattering and absorption, Pais-Piccioni phenomenon, 11: 6851(J)

scattering by nucleons, application of dispersion relations to low-energy, 11: 10219(J)

scattering by nucleons, relativistic theory, 11: 6564(J)

scattering by nucleons, theory, 11: 528(J), 1688(J), 3594(J), 3980(J), 4731(J), 5651(J), 5657(J)

scattering in $T = \frac{3}{2}$ state, covariant integral equation for, 11: 2002(J)

scattering of 78-Mev, by Cu, 11: 3001(J)

scattering theory, meson-meson, 11: 2015(J)

scattering theory, meson-nucleon, 11: 5651(J), 5657(J)

symmetries in interactions, 11: 8120(J)

theory, 11: 3499(J)

theory, dispersion relations for fixed-source, 11: 2008(J)

theory, nuclear propagation function in quadratic approximation, 11: 4017(J)

theory, properties of fixed-source, 11: 11343(J)

theory, renormalization constant identities in S(S) and PS(PS), 11: 13559(J)

theory of intermediate coupling approximation, 11: 2043(J)

violation of charge independence in strong interactions, 11: 13400(J)

weak interactions of, parity nonconservation in, 11: 12850(J)

Mesons (χ)

decay difference, comparison with τ meson, 11: 3996(J)

Mesons (κ)

capture phenomena, 11: 521, 3995(J), 5487(J)

classification of types, 11: 1999(J) 2000(J)

decay, isotopic spin change in, 11: 6848(J)

decay theory, 1260(J), 2004(J), 2011(J), 3446(J), 3519(J), 3984(J), 3985(J), 5466(J), 5472(J), 5481(J), 5483(J)

Mesons (κ) (cont'd)

detection and measurement, methods, 11: 1542(R), 2005(J)

interactions and decay in flight, 11: 1613(J)

interactions in hydrogen, 11: 1923(R)

interactions and lifetimes, 11: 3180, 6868(R), 10196

production, 11: 3180, 4616

production of long-lived neutral, evidence of, 11: 1277(R)

production in nuclear emulsions exposed to 6.2-Bev protons, 11: 2005(J)

production in pion-nucleon and nucleon-nucleon collisions, 11: 1615(J)

production of positive and negative, 11: 1923(R)

properties, 11: 1542(R)

reaction with C^{12} to produce 3 α particles, 11: 2151(J)

scattering with change of intrinsic parity, theory, 11: 6578

spin studied by antiproton annihilations in nuclear emulsions, 11: 3977

star produced by, theoretical analysis, 11: 3446(J)

stars in nuclear emulsions produced by, 11: 6865(R)

Mesons (κ^-)

cloud-chamber study of properties, 11: 3000(J)

decay modes and time-reversal invariance, 11: 6028(J), 6029(J)

interaction and decay in emulsion, 11: 4954(J)

interactions at rest with two nucleons, 11: 4594(J)

interactions in flight in nuclear emulsion, 11: 10197

interactions in hydrogen bubble chambers, in flight, and at rest, 11: 10233(R)

mass, 11: 535(J), 4615(R)

mean life and cross section in hydrogen, 11: 5998(J)

Mesons (κ^0)

properties of long-lived, 11: 5993(J)

three-pion decay modes, 11: 9421(J)

Mesons (κ^+)

angular distribution of secondary, 11: 9426(J)

decay modes and mean life of scattered, 11: 524(J)

elastic scattering in emulsions, analysis of data on, 11: 8103(J)

interactions in nuclear emulsion, 11: 10233(R)

interactions with emulsion nuclei from 40 to 160 Mev, 11: 5983(J)

interactions with nucleons, 11: 5484(J)

interactions with nucleons and nuclei, 11: 5470(J)

lifetime, maximum likelihood estimation, 11: 9416(J)

mass and decay characteristics, 11: 1259(J)

nuclear scattering from 60 to 100 Mev, 11: 5469(J)

production, 11: 5475(J), 5996(J)

scattering by nucleons, 11: 2163, 4616, 6138(J), 6139(J)

Mesons (μ)

absolute intensity of low-energy, in cosmic radiation, 11: 1932(J)

angular correlation in β decay of, 11: 10204(J)

angular distribution from π- μ decay, 11: 9425(J)

anomalous magnetic moment, 11: 1612(J)

anomalous scattering, 11: 5467(J)

beta decay of polarized, energy dependence of asymmetry in, 11: 8105(J)

capture in condensed matter, radiative yields from, 11: 5984(J)

capture rate, theoretical estimate of four-fermion interaction on, 11: 10200(J)

catalysis of nuclear processes in liquid hydrogen by, 11: 13523(J)

Mesons (μ) (cont'd)

catalysis of nuclear reactions by, 11: 5515(J)

Cherenkov radiation from 84-Mev to 4.2-Bev, passing through Plexiglass, 11: 6483(J)

decay, nuclear emulsion evidence for parity nonconservation, 11: 10215(J)

decay, polarization of electron from, 11: 9424(J), 12820(J)

decay, radiative corrections to asymmetry parameter of low-energy positrons in, 11: 11345(J)

decay and absorption in propane bubble chamber, 11: 12824(J)

decay and the two-component neutrino, 11: 6987(J)

decay and time reversal, 11: 12822(J)

decay theory and nonconservation of parity, 11: 6030(J), 12827(J)

decay with parity nonconserving interactions and radiative corrections in two-component theory, 11: 11341(J)

depolarization, influence of strong magnetic field, 11: 10678(J)

electromagnetic interactions, 11: 3500(J)

energy levels for spin $\frac{1}{2}$ in coulomb field, 11: 10790(J)

energy loss of 3- to 100-Bev, in He, 11: 6493

energy spectrum in $K\mu_3$ decay, 11: 12834(J)

formation from decay of positive hyperon and single-charge hyperon fragment, 11: 522(J)

formation from π^+ decay in flight dynamics, 11: 548

fusion induced by, 11: 10213(J)

interactions produced by, 11: 6487

interactions with nuclei, validity of Williams-Weizsacker method in treating, 11: 570(J)

interactions underground, 11: 3989(J), 10207(J)

interactions with nucleons, 11: 12163(J)

life spans in V, Cr, and Mn, 11: 521

magnetic moment, 11: 3993(J), 5994(J), 5995(J), 9423(J)

mass, 11: 533(J), 5494

mean life in C, Mg, and NaO, 11: 12176(J)

momentum spectrum of, from decay of $K_{\mu 3}$ mesons and spin of $K_{\mu 3}$ meson, 11: 6844(J)

neutron production by, in lead, 11: 9415(J)

neutron production by, in Na and Mg, 11: 6114(J)

nuclear interactions and presence at great depths of cosmic, 11: 2945(J)

pair production, 11: 10672(J)

parity conservation in π-μ-e decays, 11: 7302(J)

polarization direction in pion decay, proposed experiment, 11: 10681(J)

polarization in a strong magnetic field, 11: 13401(J)

polarization of, observed in a propane bubble chamber, 11: 12824(J)

polarized beam experiments, 11: 10223(J)

production of recoil electrons by passage of, through Fe and Pb, 11: 5937(J)

range-energy and range-momentum curves, 11: 12281

range spectrum at sea level at geomagnetic latitude 24°N, 11: 12162(J)

scattering of high-energy, in lead, 11: 9039(J)

spin predictions on the basis of burst production, 11: 2001(J)

velocity spectra at sea level, of cosmic ray, 11: 12186(R)

Mesons(μ^-)

catalysis of nuclear fusion reactions by, 11: 13442(J)

catalysis of nuclear reactions between hydrogen isotopes by, 11: 6937(J)

Mesons (μ^-) (cont'd)

mean life time in Al, C, Pb, and S, 11: 12173(J)

nuclear reaction catalysis, 11: 10233(R)

Mesons (μ^+)

magnetic moment of free, 11: 4972(J)

polarization, information from muonium experiments, 11: 10216(J)

Mesons (π)

absorption of slow negative, by elements in nuclear emulsions, 11: 9017(J)

angular correlations in μ-e decays of, in a magnetic field, 11: 10212(J)

angular distribution of elastic scatters, 11: 1923(R)

angular distribution of muons from π-μ decay, 11: 9425(J)

antiproton annihilation into, selection rules, 11: 4628(J)

cloud chamber studies of He stars, 11: 8549(R)

collisions with Pb nuclei, inelasticity in, 11: 1677

coupling constants in nuclear forces, determination, 11: 2049(J)

cross sections of nuclei for high-energy, 11: 13463(J)

decay, experiment to determine the direction of μ-meson polarization, 11: 10681(J)

decay processes, explanations in frame of the universal Fermi interaction, 11: 9034(J)

decay properties, 11: 8117(R)

diffraction scattering of high-energy, by nuclei, 11: 3997(J)

dispersion equations for, 11: 2995(J)

elastic scattering by protons, measurement in nuclear emulsions, 11: 10342(J)

electromagnetic properties, 11: 1609

energies of secondary, from τ decay, 11: 4953(J)

energy spectrum in $K\mu_3$ decay, 11: 12834(J)

exchange potential, 11: 10677(J)

formation and star production on reabsorption by nucleus, 11: 3992(J)

formation at 1000 Mev, 11: 9041(J)

formation from antiproton-proton collision, 11: 4027(J)

formation in p-p interactions at 650 Mev, 11: 759(J)

gamma decay of neutral, 11: 12171(J)

gamma quanta from collision of nuclei with, 11: 3003(J)

identification in nuclear emulsions, 11: 3960(J)

interaction of P- and S-wave, with fixed nucleons, 11: 3025(J)

interaction with 4.5-Bev protons, 11: 3994(J)

interactions, vertex corrections to K meson-, 11: 10676(J)

interactions with hydrogen, cross sections for production of hyperons, 11: 12828(J)

interactions with nucleons, 11: 3003(J), 4036(J), 5509(J), 5999(J)

interactions with nucleons and hyperons, non-local models, 11: 7301(J)

interactions with nucleons and nuclei, 11: 9041(J)

interactions with π mesons, cross sections, 11: 5480(J)

interactions with pions, 11: 5482(J)

mass, 11: 533(J)

meson production in deuterium by 1.4-Bev, 11: 1614(J)

nucleon coupling constants and phase shifts, 11: 2007(J)

nucleon interaction coupling constant, determination from scattering experiments using dispersion relations, 11: 9036(J)

nucleon interactions, 11: 9422(J)

nucleon interactions, S waves and K mesons, 11: 12821(J)

nucleon scattering, comparison of spin-flip dispersion relations, 11: 2042(J)

Mesons (π) (cont'd)

nucleon scattering, nucleon magnetic moments contribution to radiative, 11: 9061(J)

pair production of s-wave, theory, 11: 5076(J)

parity conservation in π-μ-e decays, 11: 7302(J)

photoproduction, 11: 532(J), 548, 1542(R), 2995(J), 2996(J), 3003(J), 5050(J), 5630(J), 5631(J), 5982(J), 6484(J)

photoproduction at complex nuclei, 11: 13407(J)

photoproduction cross section of charged, on nuclei with isotopic spin zero, 11: 12837(J)

polarization effects in reactions, 11: 3003(J)

polarization in $d + \pi \rightarrow p + p$ and $d + \pi \rightarrow n + p$ reactions, 11: 10759(J)

production by inelastic scattering of electrons in H, 11: 4598(J)

production by proton bombardment of Be and C at 660 Mev, 11: 4601(J)

production by photons from H, angular distribution of positive, 11: 11342(J)

production by pions, Monte Carlo calculation, 11: 9417(J)

production cross sections in Li^6 and Li^7, 11: 4713(J)

production from tau meson decay, 11: 3978

production in carbon by 308 Mev π^- mesons, 11: 6485(J)

production in electron-proton collisions, 11: 1609

production in nucleon-nucleon collisions, 11: 3003(J), 5689(J), 5991(J)

production in pion-nucleon collisions, 11: 5691(J), 9420(J)

production in p-p collisions, 11: 1262(J), 1676, 5474(J)

production of neutral, by high-energy protons, 11: 10666(J)

production of neutral, from H at forward angles from 240 to 480 Mev, 11: 11339(J)

production of strange particles by, on protons, 11: 9037(J)

production theory considering all scattering states in one-meson approximation, 11: 9186(R)

range-energy and range-momentum curves, 11: 12281

range-energy curve in emulsion, high-point on, 11: 10664

reactions of, 11: 2995(J)

reactions with nuclei, gamma quantum emission in, 11: 2167(J)

S-wave, in the reaction $p + p \rightarrow \pi^+ + d$, 11: 10682(J)

scattering, 11: 532(J)

scattering, machine analysis by the maximum likelihood method, 11: 9154(J)

scattering, theory of pion-nucleon, effect of nucleon recoil, 11: 3628(J)

scattering by nucleons, 11: 588(J), 749(J), 1678(J), 3003(J), 3628(J), 3997(J), 6486(J)

scattering by nucleons and structure of fourth-order matrix elements in Ps(Ps) theory, 11: 13411(J)

scattering by protons, 11: 3199(J), 4597(J)

spectra, 11: 10197

theory of low-energy, 11: 8107(J)

theory of p-wave interaction with nucleons, 11: 5074(J)

in three-body force theory, 11: 13438(J)

Mesons (π^-)

absorption cross sections for 4.2-Bev, 11: 4615(R)

capture by Be and C nuclei, 11: 4133(J)

capture of stopped, by hydrogen, 11: 9038(J)

disintegrations of light nuclei in nuclear emulsions by slow, 11: 694(J)

double stars in nuclear emulsions due to 220-Mev, search for, 11: 2999(J)

Mesons (π^-) (cont'd)

hyperons produced by 1.3-Bev, in H, 11: 527(J)

interaction lengths and diffraction scattering of 4.2-Bev, in G5 emulsions, 11: 4952(J)

interaction with Pb, Cu, O, and Be in energy range 140 to 400 Mev, cross sections for, 11: 12830(J)

interactions of low-energy, with nuclei, 11: 12826(J)

interactions with protons in 1-Bev region, 11: 1285(J)

mean free path of 4.3-Bev in nuclear emulsions, 11: 5473(J)

production by cosmic rays in nuclear emulsions, energy spectrum, 11: 3898(J)

reactions with Ag, yields of Pd, Rh, and Ru isotopes from, 11: 3022(J)

scattering by H from 10 to 30 Mev, 11: 4596(J)

scattering by protons, cross section estimates, 11: 537(J)

Mesons (π^0)

angular distribution, produced by high energy jet showers, 11: 13365(J)

gamma rays from decay of, 11: 584(J), 4000(J)

lifetime, 11: 696(J), 6849(J)

photoproduction on complex nuclei, 11: 8100(J)

production from proton-proton collisions near threshold, 11: 10675(J)

Mesons (π^+)

absorption by deuterons at 118 Mev, 11: 5985(J)

decay, 11: 548, 6018(J), 6022(J)

decay, $\rightarrow \mu + \rightarrow e^+$ angular correlation in nuclear emulsion, 11: 12819(J)

decay, nuclear emulsion evidence for parity nonconservation, 11: 10215(J)

elastic scattering of 310-Mev, from protons, 11: 4734(J)

energy spectrum of, produced in p-p collisions at 556 and 657 Mev, 11: 4600(J)

formation in cosmic radiation hodoscopic delayed coincidence method for studying, 11: 1937(J)

interactions of 85-Mev, with deuterons, 11: 3981(J)

production by 340-Mev protons, Z dependence, 11: 5989(J)

production in p-p collisions at 660 Mev, 11: 4599(J)

production in photographic emulsion nuclei by 460-Mev protons and 400-Mev neutrons, 11: 3998(J)

production of, in H by 660 Mev protons, 11: 12832(J)

proton scattering by, D wave effects, 11: 9060(J)

scattering by hydrogen, 11: 5664(J), 6136(J)

scattering by H at 176 to 307 Mev, phase shift analysis, 11: 12831(J)

scattering by protons at 83 Mev, 11: 10344(J)

scattering by protons at 100 Mev, 11: 10343(J)

Mesons (τ)

decay, 11: 536(J), 1259(J), 2003(J), 3501(J), 3502(J), 3540(J), 3978, 3984(J), 3996(J), 12168(J)

depolarization, 11: 525(J)

dispersion relations for decay, 11: 10199(J)

lifetime, maximum lifelihood estimation, 11: 9416(J)

lifetimes, 11: 6868(R)

mass determinations, 11: 1259(J), 1610

method of studying, 11: 9411(J)

parity mixing effects in decay, 11: 10224(J)

production, 11: 3501(J)

scattering, 11: 1630(J), 5365(R)

spin, 11: 8104(J)

spin and parity, 11: 523(J), 4950(J), 5465(J)

Mesons (τ^+)

angular correlations between decay planes and production geometry, 11: 3503(J)

decay into pions, 11: 4953(J)

lifetime, 11: 3982(J)

spin, 11: 12186(R)

Mesons (θ)

composition, spin, and mass, 11: 3991(J)

decay, isotopic spin changes in, 11: 536(J)

method of studying, 11: 9411(J)

parity mixing effects in decay, 11: 10224(J)

properties, theoretical analysis, 11: 1286(J)

regeneration by magnetic fields, 11: 5478(J)

scattering of, relative to τ, 11: 5365(R)

Mesons (θ^0)

cloud chamber study of anomalous decays, 11: 5990(J)

disintegration and mass, 11: 4001(J)

production from an S-event, 11: 12175(J)

spin, 11: 3987(J), 4204(J)

systematics of decay, 11: 10206(J)

Metabolism

(See also Plant metabolism; Animal Metabolism; Mineral metabolism.)

of carbon-^{14} labeled compounds in intact animals, development of radio-Warburg apparatus for, 11: 4814(R)

in cells, effects of irradiation, 11: 6611(J)

chemical effects of Th, Po, Sr, Ba, Y, Ce, and Pu on, 11: 7055(J)

of copper in rats, tracer study, 11: 2807

effect of Po on, 11: 2245(R)

effects of ionizing radiations, 11: 6611(J)

of fatty acids, effects of radiation, 11: 2233(R), 13565(R)

of fatty acids in rats, effects of x radiation, 11: 2237(R)

function tests, tracer methods, 11: 10803(R)

of iron, diagnosis of disturbances by radioiron exchange method, 11: 6630(J)

measurement using a radiometric Warburg apparatus, 11: 4814(R)

of phosphorus in mouse liver, effects of irradiation, 11: 20

in plants and animals, tracer studies, 11: 17(J)

of Po^{210}, species differences, 11: 9975

of proteins, radiation effects in rabbits, 11: 11022(R)

radiation and temperature effects in rats, 11: 10394

radiation effects, 11: 13566(R)

radiation effects on protein and nucleoprotein, in rats, 11: 7052(J)

radioinduced changes in rat liver, 11: 4230(J)

tracer studies, 11: 63(J), 3330(R)

tracer techniques for clinical studies, 11: 2812(J)

Metabolism cages

design for swine, 11: 11877(R)

for small animals, with equipment for radiometric determination of respiratory $C^{14}O_2$, design, 11: 896

Metal–biphenyl systems
See Biphenyl–metal systems.

Metal–ceramic couples
See Ceramic–metal couples.

Metal chloride complexes

formation and ion exchange separation, 11: 12970(R)

Metal coatings

(See also Coatings; Plating; Slug coatings.)

deposition on metals for high temperature service, methods, 11: 11179(R)

electrophoretic analysis, 11: 13093(R)

electroplating on titanium, 11: 11214

hardness measurements at 1200°F, 11: 4545

heat and corrosion-resistant, testing equipment, 11: 3385(R)

high-temperature properties at 1200 to 1700°F and above, panel on, 11: 4881

for uranium and U alloys, barrier coats, 11: 8463

Metal complexes

bond energies in transition, 11: 9988(J)

x-ray absorption edges of metal ions in, 11: 737(J)

Metal crystals

directional dilatation lattices at elevated temperatures, 11: 10454(J)

small angle scattering from deformed, 11: 8044(J)

twinning modes in, 11: 3710(J)

vise for handling, setting of, 11: 9759

Metal foil detectors

(See also Plastic-film detectors.)

calibration for personnel neutron monitoring, 11: 2605

design and characteristics, for personnel neutron dosimetry, 11: 4569

design of $P^{31}(n,p)Si^{31}$ threshold detector, 11: 2607

flux measurements in multiplying lattice using europium oxide foils, 11: 13173

performance as neutron dosimeters, 11: 7920(R)

Metal halides

(See also Alkali metal halides.)

anion effect on electrode potentials on fused salts, 11: 83(J)

distribution between hydrohalic acid and organic solvents, mathematical analysis, 11: 3764(J)

nuclear quadrupole resonance spectra of group IIIB, 11: 8117(R)

thermodynamic properties, 11: 9835

Metal Hydrides Inc., Chemical Research Lab., Beverly, Mass.

progress reports, 11: 13825(R)

progress reports on preparation of uranium hydride, 11: 12436

progress reports on reductions of uranium oxides, 11: 2399(R), 9745(R), 12428(R)

Metal–metal oxide systems
See Cermets.

Metal-organic compounds
See Organic compounds, metallo-.

Metal oxides
See Oxides.

Metal plates
See Plates.

Metal powders

apparatus for preparing, under protective atmospheres for x-ray study, 11: 1459

drying for neutron transmission measurements, 11: 5329

explosive limits, handling, safety, and toxicology, 11: 6741

inflammability and explosibility, 11: 10551

Metal–salt systems (liquid)

distribution of elements in, 11: 8268

equilibrium studies and separation factor, 11: 13885(R)

Metal systems

liquid immiscibility, 11: 5361(J)

Metallex Process

chlorination of ThO_2 and reduction of $ThCl_4$, 11: 7504(R)

development, 11: 7514(R), 8359(R), 12991, 12995(R)

dry-salt contractor flow sheets, 11: 7417(R), 8354

equipment, 11: 12992

flowsheets, 11: 11696

metal quality and amalgam dissolution, 11: 7511(R)

metal target sample preparation and testing, 11: 9619

optimum conditions for reduction of $ThCl_4$ to ThHg, 11: 12993(R)

performance of PDA-Amalgam exchange, 11: 11567(R)

product quality, effects of surface exposure on, 11: 13653(R)

production of Th quasi-amalgam, 11: 8353, 10836(R)

studies on effects of Mg addition and voidage on Th product quality, 11: 7512

test runs using PDA exchange system, 11: 13644(R)

thorium(IV) chloride reduction, $ThOCl_2$ preparation, and Th dissolution, 11: 7503(R)

thorium production, cost estimates, 11: 7507(R)

thorium tetrachloride preparation, 11: 8352(R)

thorium tetrachloride reduction with Na amalgam, 11: 13656(R)

Metallic films

(See also Coatings; Metal coatings; Metallic foils.)

preparation of thin, by vacuum evaporation, 11: 3007

vacuum evaporation of heavy, 11: 6377

Metallic filters

safety device for flash back of explosive gases, 11: 462(J)

Metallic foils

polarization of nuclei in, 11: 5528(J)

preparation, 11: 13085

Metallography

abrasive cutting of irradiated U, 11: 8503

direct observation of metal surfaces by means of electrons discharged by ions, 11: 11304(J)

electron, application of cathodic vacuum etching to, 11: 13823

equipment, 11: 11170

high-resolution radioautography applied to, 11: 4882

hot laboratory facility for, 11: 4837

hydrogen etching hot stage for, 11: 13787(R)

marking method for correlating external marks with internal structure, 11: 11552(P)

of radioactive materials, techniques, 11: 9322

sample preparation, comparison of cathodic discharge and chemical etching, 11: 12051

sample preparation, plastic mounting material, 11: 3428

specimen mounting and replication of microstructure with indium, 11: 13808

of uranium, sample preparation, 11: 7657(R)

Metallurgical equipment

design for melting and pouring radioactive metals, 11: 13334

vise for handling Ni crystal, setting, 11: 9759

Metallurgy

(See also Powder metallurgy; Tracer techniques (metallurgy).)

in atomic energy, 11: 1889(J)

metallo chemical table of chemical elements, 11: 10095(J)

in nuclear power industry, 11: 3270(J)

in reactor development, role of, 11: 11787

research program bibliographies and summaries, 11: 3847

Metallurgy conferences

at Ames Lab., Iowa State College, Ames, Iowa, May, 1956, 11: 4464(R)

analysis and metallography of H in U, 11: 7643

at KAPL, October, 1955, 11: 3428

symposium on Ti heat treating and alloying, Case Inst., Cleveland, Nov., 1956, 11: 7195

technical papers of Eighth Metallographic Group meeting, Dec. 1953, 11: 13808

on uranium, Th, and their alloys, 11: 8522

on U inclusions at Battelle, October 25, 1954, 11: 13099

Metals

(See also Alkali metals; Alloys; Building materials; Metal powders; Platinum metals; Porous metals; Rare earths; Reactor materials.)

activation energy of high-temperature creep in, 11: 8033(J)

annealing in neutron irradiated, mechanism, 11: 13548(J)

bonding, fundamentals of glass to metal, 11: 10573(J)

bonding, two-stage model for solid-phase, 11: 12662

bonding or pressure welding, bibliography, 11: 13819

bonding to glass, 11: 13332

bonding with adhesives, 11: 5853(R)

brittle strength, statistical theory, 11: 388(J)

cathodic etching, 11: 12456(R)

cathodic vacuum etching, application to electron metallography, 11: 13823

ceramic-coated, for radiation reflection and protection from corrosion, 11: 4857

cleaning of surfaces of, using gas discharge, 11: 8059(J)

coating for high-temperature service, methods, 11: 11179(R)

coating of, development of Teflon, 11: 258

coating of heavy metals by vacuum evaporation, 11: 6377

colored, voltages in fused chlorides of alkaline metals, 11: 11925(J)

combustion analysis for C, 11: 3700

complexometric titration following cupferron separation of interferences, 11: 5785(J)

corrosion, atmospheric, investigation of, 11: 6352(J)

corrosion by Cl_2 containing water vapor, 11: 1916(J)

corrosion by hydrofluoric acid, 11: 12459

corrosion by isopropyl biphenyl, 11: 4431

corrosion by liquid metals and liquid alloys containing U, 11: 9747

corrosion by H_2O_2, 11: 8450(R)

corrosion by H_2SO_4 and HF, 11: 8457

corrosion by water, effects of H_2 on, 11: 7993(J)

corrosion-resistant, selection of, 11: 8932(J)

Coulomb field shielding by free charges in, 11: 8244(J)

crystal structure, relation between bond hybrids and metallic structures, 11: 7226(J)

crystalline structure and physical properties, atomic deformation effects, 11: 11282(J)

Curie temperature displacement by hydrostatic pressure, 11: 12095(J)

Metals (cont'd)

damping capacity, 11: 6749

decontamination by electropolishing, 11: 2500

diffusion coefficients of, methods for determining, 11: 1131(R)

diffusion into oxides, 11: 3832(R)

diffusional mobility of atoms in melting and recrystallization of, 11: 12062(J)

drawing, automatic recording of variables in, 11: 8002

effects of radiation on, and metallurgical processes, 11: 4898(J)

elasticity modulus, temperature dependence, 11: 342(J)

electrical and thermal conductivity, 11: 1769(J)

electrical resistivity, theory, 11: 8508(R)

electrodeposition, effects of colloidal-system formation on, 11: 341(J)

electrodeposition from organic solutions, 11: 1898(J)

entropy of solid and liquid, 11: 6744(J)

etching, modified cathodic vacuum procedure for, 11: 13102

evolution of gas and permeability to gas of, of interest as construction materials for vacuum systems, 11: 1510

extrusion, K factors based on starting loads, 11: 13815

fabrication, bibliographies, 11: 2226

fatigue, effects of frequency and temperature, 11: 10558

fatigue of, in liquid Sn and liquid Na, 11: 1910(J)

Fermi surface determination by De Haas-Van Alphen effect, 11: 10577(J)

ferrous, chemical determination and analysis methods, review, 11: 5787(J)

fiber textures, correction factor for quantitative determination, 11: 359(J)

fluctuating currents in, 11: 5377(J)

grain-boundary diffusion coefficient for, method of determining, 11: 1145(J)

grain structure, effects of vibratory treatment on, 11: 2921

high-temperature properties, survey, 11: 8474

high temperature x-ray diffraction measurements of thermal expansion 11: 260

hot tearing from stress during solidification and cooling, new approach to, 11: 1905(J)

hydrogen evolution kinetics and electronic and adsorptive properties, 11: 5908(J)

hydrogenation, apparatus for, 11: 12456(R)

laboratory scale arc melting unit for, 11: 5339

low-temperature radiation effects, 11: 9158(J)

mechanical properties, effect of neutron irradiation on, 11: 361(J)

melting and pouring of radioactive, 11: 13334

neutron reactions (n,p) in Mg, Al, Fe, Ni, Cu, Nb, Mo, Rh, Pd, and In, 11: 8190

nonferrous, chemical determination and analysis methods, review, 11: 5788(J)

nonferrous, methods of analysis, 11: 2837(J)

nuclear magnetic resonance and electron paramagnetism in, 11: 6426(J)

nuclear quadrupole resonance, 11: 614(J)

order-disorder phenomena, 11: 6427(J)

oxidation and diffusion, review, 11: 5358(J)

oxidation of, subjected to increasing temperature, 11: 1076

oxidation rate, transition state theory, 11: 5836(R)

oxide film formation, 11: 448(R)

paramagnetic resonance and polarization of nuclei, 11: 3004(J)

Metals (cont'd)

physical and mechanical properties, testing facilities for determination of, 11: 10518

plastic deformation, theory, 11: 1144(J)

radiation damage, 11: 763(J), 2185(J), 5668(J), 6565(J)

radiation damage in, thermal spike picture, 11: 13210

radiation effects, evaporation from surface of, 11: 12288(R)

radiation effects of gamma rays and neutrons on, 11: 8858(J)

radiation effects on mechanical properties, 11: 12624

relaxation, equipment for measuring, 11: 5344

research studies, applications of nuclear irradiation and radioisotopes, 11: 1535

self diffusion, effects of irradiation, 11: 7405(R)

self-diffusion coefficients, measurement, 11: 11235(J)

self welding of, effect of Na on, 11: 7727

separation by selective precipitation, 11: 3633(P)

solubility in liquid zinc, 11: 12739

solubility of H in, bibliography on, 11: 4878

solvent extraction with di-2-ethylhexyl phosphoric acid, 11: 4841

spectrometric analysis for gases, equipment design, 11: 4469

spectroscopic examination, 11: 463(J)

stopping power as function of Z for, 11: 9451(J)

surface analysis by activation and radiation scattering methods, 11: 107

surface area measurement, 11: 6363

surface defects, testing Zyglo for use in detecting, 11: 3397

surface reactions of black and non-ferrous, in pyro- and electrometallurgical processes, 11: 3436(J)

surfaces, direct observation by means of electrons discharged by ions, 11: 11304(J)

temperature coefficients of solubility in dilute metal solution, 11: 10562

thermal conductance of contacts between, 11: 4893(J)

thermal expansion of pure, factors controlling, 11: 1172(J)

thermal properties, bibliographies, 11: 5872, 6362

thermal scattering of electrons of, modified deformable potential for, 11: 4523(J)

transition, absorption and half-widths of ions in fused salts, 11: 5278(J)

transition, and their compounds, superconductivity, 11: 11484

unstressed, attack by liquid Hg, 11: 5313(J)

vacancies and interstitials, resistivity minima, 11: 4499(J)

vacuum fusion analysis for N_2, O_2, and H_2, 11: 4826

vacuum utilization outgassing, 11: 1520

vaporization, 11: 7942

vaporized, emissivity of spectral lines, 11: 795(J)

wear and surface friction properties of, in water, 11: 12057

x-ray investigation of deformation and bond strength in crystal lattice, 11: 5328(J)

Metals (liquid)

(See also Liquid baths; Reactor fuel alloys (liquid).)

abstract bibliography, 11: 313, 1127, 3845

abstract bulletin on technology, 11: 10510

cooling properties, survey, 11: 4695(J)

corrosive effects, 11: 683(J), 7186(J)

corrosive effects on refractory metals, 11: 7677(R)

Metals (liquid) (cont'd)

diffusion coefficients, measurement of, 11: 2932(J)

handling techniques, 11: 5832(J)

heat capacity, estimation by empirical methods, 11: 10115(J)

heat transfer, natural convection, 11: 7328(R)

heat transfer and fluid flow, facility for studying, 11: 13149(R)

heat transfer by, 11: 683(J), 2701, 3383, 3791, 5357(J), 5832(J), 11669

heat transfer characteristics, 11: 13597(R)

high-temperature reactions with water, 11: 304, 10884(R)

level indicator for use in, 11: 452

lubricated thrust bearing, life test, 11: 2446

mass transfer, 11: 7186(J)

parameters, determination by similarity method, 11: 6396(J)

physical properties, 11: 11669

production and handling, 11: 683(J)

reaction with water, 11: 10885(R)

reactions with H_2O in nuclear reactors, 11: 12323

reactor cooling with, shielding requirements, 11: 12629

solubility of U and Ru in, 11: 7681(R)

solubility of U in, 11: 2857

solvent properties for irradiated U and Th, 11: 12490(R)

solvent properties for various metals, 11: 9332(R)

specific heats, 11: 3878(J), 13516(J)

structure of, 11: 7208(J)

surface tension, calculation by thermal evaporation, 11: 6400(J)

temperature coefficients of solubility in dilute, 11: 10562

thermodynamic properties, behavior in various environments at 600 to 1000°C, 11: 3414(R)

valves for, 11: 2421

wetting of stainless steel, W, Zr, Mo by, 11: 3247(P)

x-ray scattering, 11: 736(J)

Metamict minerals

thermal analysis, 11: 3828(J)

Meteorites

activation analysis for Li^6, He^3, and H^3, 11: 8000(J)

activation analysis for U in iron, 11: 8001(J)

age determination with C^{14}, 11: 6361(J)

age estimation by measurement of cosmic-ray-produce He^3 and H^3, 11: 11276(J)

age estimation by $Rb^{87}-Sr^{87}$ method, 11: 8001(J)

age estimation with radioactivity, 11: 6360(J)

ages, U content, and Pb content, 11: 5374(J)

beneficiation for separation of feldspars, 11: 3749

cosmic abundance of Cs in stony, 11: 10032(J)

iron, Mn^{53} content, 11: 4503(J)

isotopic analysis for Pb, 11: 8001(J)

lead isotopic abundance, 11: 4508(J)

metallic, radioactivity measurements by photographic method, 11: 288(J)

radioactivity, cosmic ray induced, 11: 12037

thorium content of stone, 11: 13352(J)

Meteorological instruments

effectiveness and design for collecting surface meteorological data, 11: 4955

Meteorological instruments (cont'd)

design and performance, 11: 7291(R)

performance, 11: 6000

Meteorology

(See also Atmosphere; Stack disposal.)

of Argonne National Lab. area, 1949 to 1954, 11: 6000

diffusion processes in the atmosphere, mathematical analysis, 11: 6615

influence of atomic explosions, 11: 9042(J)

parameters in, correlation with cosmic-ray neutron intensities, 11: 2949(J)

parameters in waste disposal, 11: 1026

program at Knolls Atomic Power Laboratory Sites, 11: 12839(J)

stack effluent tests at Brookhaven, 11: 7731(R)

turbulence in atmospheric layer near the ground, 11: 6488(J)

vertical velocities calculated according to wind field data, 11: 13413(J)

Metering pumps

air lifts as radioactive solution, 11: 1059

design of laboratory model, 11: 11493

Methacrylic acid, methyl ester polymers

casting of metallographic mounts, 11: 2252

gamma-irradiated, chemical activity, 11: 172(J)

Methane

decomposition mechanism, effect of H on, 11: 2816(J)

electron drift velocity in, 11: 4916(J)

dissociations in mass spectrum, 11: 3935(R)

fragmentation from electron bombardment, 11: 10231(R)

neutron scattering, 11: 1265

radiation effects, 11: 9579(R)

replacement by activated I^{128} of H in, 11: 1463

solubility in biphenyl, isopropyl- at atmospheric pressure and temperatures to 125°C, 11: 5406

Methane, bromo-

fragmentation from electron bombardment, 11: 10231(R)

Methane, fluoro-

thermal capacity at constant volume of, 11: 12340

Methanes, halo-

infrared absorption intensities of methylene halides, 11: 4003

Methane, iodo-

exchange reactions with I_2, 11: 3329

microwave spectra, 11: 4489(R)

Methane, trichlorofluoro-

decomposition of Freon 11, effects of radiation on, 11: 10819

Methane, triphenyl-, derivatives

solvolysis of fluoride, 11: 12186(R)

Methanol

(See also specific methanol systems, e.g., Carbon tetrachloride–methanol systems.)

bubble growths in superheated, 11: 5763

chromatographic separation and identification, 11: 6297(J)

colorimetric analysis for B, 11: 9998

radiation effects on optical properties, 11: 1805

Methanol–boron fluoride systems

See Boron fluoride–methanol systems.

Methanol–butyl phosphate–kerosene–water systems
See Butyl phosphate–kerosene–methanol–water systems.

Methanol–butyl phosphate–water systems
See Butyl phosphate–methanol–water systems.

Methanol–water systems

solvent properties, 11: 12405(R)

Methionine

absorption from gastrointestinal tract during acute radiation sickness, 11: 2800(J)

biosynthesis, 11: 4781(R)

biosynthesis in bacteria, 11: 12642(R)

radiation chemistry, 11: 6671(J)

radioactive, effects on growth of sarcoma in animals, 11: 3673(J)

radiochemical degradation, 11: 5242(J)

radiosensitivity effects in rats, 11: 11882(J)

Methyl alcohol
See Methanol.

Methyl borates

(See also specific borate systems, e.g., Methanol–methyl borate systems.)

chemical reactions with Cl_2 to form BCl_3, 11: 5188

infrared absorption analysis for hydroxyl groups, 11: 6655

physical properties, 11: 3368(R)

preparation from methanol, 11: 2992(J)

volumetric analysis for dimethoxyborine, 11: 7943

Methyl borate–boron fluoride systems
See Boron fluoride–methyl borate systems.

Methyl ether

separation from boron fluoride–methyl borate systems, 11: 13573

Methyl ether–boron fluoride systems
See Boron fluoride–methyl ether systems.

Methyl ether complexes

with boron fluoride, heat of compression, 11: 10814(R)

with boron fluorides, thermal decomposition of, effect of methyl fluoride on, 11: 12336

with boron trifluoride, conversion to BF_3, 11: 12335

with boron trifluoride, thermal capacity, 11: 12340

Methyl isobutyl carbinol
See 2-Pentanol, 4-methyl-.

Methyl isobutyl ketone
See 2-Pentanone, 4-methyl-.

Methylene blue

decolorization reactions induced by γ radiation, 11: 962(J)

radiation effects, preparation of stable free radicals, 11: 7132(J)

radiation-induced reduction in aqueous solutions, 11: 4342(J)

Mexico

radioactive precipitation in, 11: 8804(J)

Mi Vida deposits (Utah)

mineralogy and paragenesis of U ore in, 11: 1084(J)

Mica

age determinations using K–Ar and Rb–Sr decay, 11: 290(J)

age estimations by Ar^{40}–K^{40} dating, 11: 287(J)

argon content and diffusion in, 11: 10542(J)

spectrographic analysis for Ce and Ru, 11: 11933(J)

Mice

biological effects of fast neutrons and γ radiation on, a comparison, 11: 6608(J)

care, buildings and facilities for, 11: 11557

care, influence on radiosensitivity, 11: 4226(R)

dose-response to thermal and fission neutrons, 11: 864(J)

genetic effects of radiation in female, 11: 5157(J)

internal radiation dose distribution, 11: 8784(J)

life spans, effects of whole-body irradiation, 11: 8784(J)

life-spans of offspring of male, exposed to neutrons, 11: 6205

radiation dosage determinations in, 11: 3479(R), 4781(R)

radiation injuries in, relationship of dose to damage, 11: 27(J)

radiation injuries to lactating mother, effects on suckling young, 11: 2787(J)

radioinduced mutations, 11: 11855(J)

radioinduced somatic mutations in, 11: 8774(J)

radiosensitivity, 11: 21: 4786(J), 5165(J), 6609(J)

radiosensitivity, anaphylactic shock after whole body exposure to x irradiation, 11: 11020

radiosensitivity, effects of age and strain, 11: 6596(R)

radiosensitivity, effects of strain, 11: 857(J)

radiosensitivity, genetic factors, 11: 13236(J)

radiosensitivity, genetic variations, 11: 12642(R)

radiosensitivity, hybridization effects on, 11: 11852(J)

radiosensitivity, influence of divided dose, 11: 6195(J)

susceptibility to E. coli endotoxin, effects of total body x-irradiation, 11: 11865(J)

Michigan Research Reactor

hazards evaluation, 11: 2630

safety features and operation proposal, 11: 8173

Michigan. Univ., Ann Arbor

progress reports on biological effects of irradiation, 11: 830(R), 3274(R)

progress reports on nuclear chemical research, 11: 1475(R)

Michigan. Univ., Ann Arbor. Engineering Research Inst.

progress reports on boron hydrides and related hydrides, 11: 1415(R)

progress reports on heavy element separation, 11: 104(R)

Microanalysis

design of two-piece centrifuge crucible for handling precipitates in, 11: 13281(J)

Microörganisms

(See also Protozoa.)

radiation effects, 11: 3279(J)

radiosensitivity, 11: 13234

radiosensitivity in water, sewage, and sewage sludge, 11: 4236(J)

Microradiography
See Radiography.

Microscopes

(See also Electron microscopes.)

design of flying spot microscope for radioactive materials, 11: 9322

reticle-projecting, 11: 10153(J)

semi-automatic recorder for filar micrometer eyepiece for, application to track measurement, 11: 511(J)

Microscopy

(See also Electron microscopy.)

Microscopy (cont'd)

of blood, sample preparation, 11: 833

method, process, and instruments of incident-light, 11: 12113(J)

Microtomes

design modifications, 11: 8258(R)

Microwave equipment

(See also Electron tubes; Microwave oscillators; Microwave spectrometers.)

amplifiers, 11: 11346

beam collimation, measurement by Pirani gage system, 11: 1383(R)

characteristics of corrugated wave guide with a coupling hole, 11: 5943

design and theory of wave guides, 11: 4603(J)

design of beam harmonic, higher order device for producing microwaves, 11: 4531

design of link for telemetering system, 11: 12111

design of rebatron, 11: 6854(R)

development, 11: 11296(R)

focuser for maser, testing of 12 electrode type, 11: 1383(R)

modifications in maser, 11: 4489(R)

multi-cavity klystrons, tuning, 11: 1920(R)

noise figures, 11: 5369(R)

phase shifting device without reflections or continuity, 11: 5111(P)

for plasma diagnostics, 11: 10138

Microwave oscillators

design and evaluation of an S-band rebatron, 11: 12179(J)

design and evaluation of hermodatron for megavolt electronics millimeter wave generation, 11: 12180(J)

theory of rebatron, an electron bunching accelerator for use in megavolt electronics, 11: 12178(J)

Microwave spectrometers

cavity resonator design for, 11: 8025(R)

design of molecular beam, 11: 5369(R)

Microwave spectroscopy

chemical syntheses for and equipment development, 11: 8282(R)

equipment and techniques, 11: 13358(R)

g-factor anisotropy in polycrystalline samples, 11: 8025(R)

methods, effect of quantum mechanics, 11: 3880(J)

Microwaves

(See also Radar.)

amplification using a traveling wave gas cell maser, 11: 11346

dielectric measurements using, 11: 8026(J)

generation, design of beam harmonic higher order device, 11: 4531

generation, development of equipment, 11: 11296(R)

generation of 100- to 1000-micron, 11: 6854(R)

generation with relativistic electron bunching accelerator, 11: 5053

mode coupling theory, 11: 8025(R)

phase shifting device, 11: 5111(P)

production utilizing Cherenkov effect, 11: 4754(J)

for study of electron loss in gaseous discharges, 11: 1555(J)

theroy, 11: 1920(R), 13358(R)

transmission in plasma, 11: 8025(R)

transmission on wire-like waveguides, 11: 4603(J)

waveguide for, incorporating a helical conductor, 11: 10327

Middle Tygre River Placer Area (S.C.)

geology, mineralogy, monazite occurrence, geophysical exploration, 11: 3820

Midwest Research Inst., Kansas City, Mo.

progress reports on development of silicone resins, 11: 208(R)

Midwestern Universities Research Assn., Madison, Wis.

progress reports, 11: 7345(R), 12279(R)

Military facilities

vulnerability to fires induced by atomic explosions, 11: 1403

Military personnel

radiation protection, practices of the Army, 11: 7924(J)

radiological monitoring of ground crew working on radioactive jet engine systems panel, 11: 10174

shielding afforded by standard Navy barracks and underground shelters, 11: 6210, 12652

Milk

analysis for Sr^{90}, 11: 7954(J)

radioactivity level of iodine^{131} from nuclear test fall-out, 11: 9963(J)

radiostrontium content of samples collected in Canada in 1956, 11: 5172

Millisites

separation from kaolinites, 11: 291(J)

Mills

See Ball mills; Rolling mills.

Mine Safety Appliances Co., Callery, Penna.

progress reports, 11: 227, 3783(R), 4407(R, 6700(R), 10291(R), 12897(R)

Mineral deposits

genesis of, 11: 10087(J)

geophysical prospecting by dielectric constant measurement, 11: 12036

ore-forming fluid, possible composition, 11: 10087(J)

Mineral dressing

differential grinding, 11: 10547(J)

study of comminution, modification of Kick's law, 11: 10548(J)

techniques on uraninites ores, application of, 11: 7971

Mineral metabolism

of bones, 11: 6190(J)

chemical factors, 11: 893

tracer studies, 11: 3680(J)

Mineral resources

(See also Thorium reserves; Uranium reserves.)

deposits of fissionable materials, 11: 10387(J)

Minerals

(See also Radioactive minerals; Rare earth minerals.)

age estimations employing radioisotopes, 11: 5420

age measurements, evaluation of, 11: 8001(J)

computing weight per cent composition from grain counts, method of, 11: 943(J)

dating by decay of potassium^{40} into argon^{40}, 11: 13351(J)

decomposition by fusion with borax, 11: 4441(J)

dielectric constants of, in frequency range 50 cps to 30 megacycles, method of measurement, 11: 12036

flotation, influence of the electrokinetic properties of surface of, 11: 284(J)

radiation effects on physical properties, 11: 4168(J)

radiometric analysis for In, 11: 11935(J)

Mineville District (N. Y.)

radioactivity and occurrence of rare-earth-bearing apatite, geology, ore deposits, and mineralogy, 11: 2911(J)

Mining

methods and costs, 11: 3819

Mining (cont'd)

safety, a radioactive tracer technique for the study of turbulent diffusion, and mixing in coal-mine ventilation, 11: 13318(J)

Minnekahta Quadrangle (S. Dak.)

preliminary geologic map of east-central part, 11: 9293(J)

preliminary geologic map of southeast part, 11: 9294(J), 9295(J)

preliminary geologic map of west-central part, 11: 9292(J)

Minnesota. Univ., Minneapolis

progress reports, 11: 6356(R)

progress reports on fatigue properties of structural materials, 11: 5345(R)

Missiles

(See also Guided missiles.)

atomic power for, bibliography, 11: 9123(J)

launching, use of atomic power packages for, 11: 9120(J)

MIT Research Reactor

design and safety, 11: 11421

Mitochondria

desoxyribonuclease activity in isolated, radiation effects, 11: 9924(J)

Mitosis

in ascites tumor cells, effects of x irradiation, 11: 1732(J)

in bone marrow tissue cultures, effects of radiation on, 11: 41(J)

in mouse liver, effects of irradiation, 11: 20

radioinduced, in mice cornea epithelium during local and distant x-ray exposures, 11: 11854(J)

radiosensitivity in roots of Vicia, 11: 843(J)

Mixer-settlers

(See also Extraction apparatus; Spray columns.)

countercurrent testing, 11: 981

design, 11: 186(R), 8873, 10812(R), 11626

design and development of, for Redox Process, 11: 12403

design and performance for $Ca(OH)_2$ slurries, 11: 8397

design and performance of pump-mix impeller, 11: 983

design and performance of vertical solid-liquid, 11: 7489

design for processing radioactive solutions, 11: 993

design of miniature, 11: 7453

design with transverse flow in settler, 11: 10475(R)

development, 11: 13197(R)

efficiency, 11: 12404(R)

evaluation for use in radiochemical plants, 11: 12701

investigation of, for $Th(NO_3)_4$ purification, 11: 12964

operation in Redox Process, 11: 13670

performance, 11: 8333, 14020(R)

performance of ultrasonic multistage, 11: 185(R)

specifications for multistage units for Redox Process, 11: 13683

testing of ultrasonic, 11: 4363(R)

two-stage system, extraction efficiency, 11: 1822(R)

Mixers

design and performance of turbo, for continuous washing of Purex organic, 11: 11977

Mixing

mass transfer in continuous flow mixing vessel, 11: 10584

Models

See Biological models; Nuclear models.

Moderators (reactor)

See Reactor moderators.

Moenkopi Formation

stratigraphy of, in upper triassic strata in southeastern Utah, 11: 6723(J)

Mohawk River

radiobiological monitoring, 11: 6209(R), 6793(R)

Molding materials

(See also Gypsum products; Plastics.)

testing of plastisol, 11: 2444

Molds

(See also as main heading by the material of the mold, e.g., Graphite molds and Dies.)

materials for Ti casting, 11: 2923

metal, for casting U, 11: 13699

of plastisol for plastic casting, 11: 2444

Molecular beams

(See also Ion beams.)

elastic scattering from solid surfaces, 11: 13356

paramagnetic resonance, 11: 1920(R)

scattering in gases at low velocity, 11: 539

techniques and applications, survey, 11: 8109(J)

Molecular properties

calculation of valence states and molecular binding energies, 11: 4490(R)

models relating molecular reactivity and diffusion, 11: 4005(J)

Molecular rearrangements

deamination of 1,2,2,-triphenylethylamine with HNO_2, 11: 958(J)

Molecular structure

bond length and angle, internal rotation, transferability of force constants, review, 11: 4604(J)

calculation of orbitals, computer coding for, 11: 10226

of inorganic crystalline compounds, 11: 2845(J), 2846(J)

neutron-diffraction analysis, 11: 9429(J)

Molecules

mesic, nuclear fusion probability in, 11: 12083(J)

slow-neutron scattering by, theory, 11: 6953(J)

spin intercombinations in, 11: 4755(J)

structure of, neutron-scattering analysis, 11: 591(J)

Mollusks

adsorption, uptake and metabolism of fission products and radionuclides by clams, 11: 3675

Molybdate ions

as corrosion inhibitors, electrochemical properties, 11: 11576(R)

Molybdates

corrosion inhibition, 11: 10533

Molybdenum

adsorptive properties for Ni and Zr, 11: 7976

alloying effect on cermet binder, 11: 10523

alloying effects on high-temperature rupture strength of ferritic steel, 11: 1168(J)

alloying with U to improve corrosion resistance of U alloys, 11: 6588(P)

annealing of point defects in cold-worked, 11: 10093(J)

coating, 11: 348(J)

coating with Al–Cr–Si oxidation-resistant alloy, 11: 12749

Molybdenum (cont'd)

colorimetric determination by butylacetate–thiocyanate method, 11: 10815(R)

conductometric determination in Mo–U alloys, 11: 6657

corrosion, 11: 348(J)

corrosion in liquid metals, 11: 13113(R)

corrosion prevention at high temperature with metal and ceramic coatings, 11: 3401(J)

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

creep, effects of dispersion of oxides on, 11: 5360(J)

determination in titanium alloys by precipitation from homogeneous solutions using thioacetamide, 11: 10001(J)

determination in Zr, 11: 8517(R)

determination of microgram amounts in Pu alloys, 11: 2865(J)

determination of O_2, H_2, and N_2 in, 11: 10445(J)

deuteron reactions (d,n), 11: 9778

dissolution, ultrasonic effects, 11: 5889(R)

electrodeposition on uranium, 11: 8486

electrodialysis, 11: 987

emissivity and reflectivity, measurement of total normal, 11: 6421

extraction from Amine Extraction Process solution by chloride stripping, 11: 4361(R)

fabrication and welding of arc-cast, 11: 375(J)

fabrication of sheet, ductility, heat treatment, and rolling, 11: 2913

high-temperature corrosion by $NaF–UF_4$ and $LiF–UF_4$ systems, 11: 13762

high-temperature strength, 11: 7206(J)

K fluorescence yield, 11: 5545(J)

liquid metal extraction from Cr–U alloys, 11: 7677(R)

mechanical properties, 11: 13339(R)

metallurgy of, book, 11: 9342(J)

neutron cross sections, 11: 9752(R), 13197(R)

neutron scattering at 4.4 Mev, 11: 3592

neutron total cross sections and resonance parameters, 11: 9078(J)

photometric determination of rhodanide complex, 11: 10446(J)

physical properties, effects of impurities on, 11: 4466(R)

physical properties, effects of alloying elements and processing on, 11: 7206(J)

polarographic behavior in EDTA, 11: 957(J)

properties of fission product, 11: 4929(J)

protective coatings for, preparation by electrophoretic methods, 11: 8009

radiation damage, 11: 1167(J)

radiochemical determination and separation in fission product mixtures, 11: 5822(J)

recrystallization temperature, 11: 10006(J)

separation from ether–$UO_2(NO_3)_2$ solutions, 11: 13016

separation of Zr and, from U with Ag, 11: 8512(R)

separation with W from Ta, Ti, Nb, and Zr, 11: 3703

solvent extraction, effects of concentration on, 11: 3765(J)

solvent extraction from ferrous materials using acetylacetone, 11: 10442

solvent extraction from process solutions, 11: 7472(R), 7473(R)

solvent extraction in Amine Extraction Process, 11: 8869(R)

solvent extraction into $CHCl_3$, 11: 9580(R)

solvent partition behavior in Amine Extraction Process, 11: 5262(R)

Molybdenum (cont'd)

solvent partition in TBP–kerosene–U nitrate systems, 11: 10808

spectrographic determination in Bi and Bi–U alloys, 11: 4283

spectrographic determination in UF_4, 11: 2257

spectrophotometric determination in Mo–U alloys, 11: 1447

spectrophotometric determination in reactor solutions, 11: 12973(R)

spectrophotometric determination of fission-product, 11: 13581(R)

structure, face-centered cubic, 11: 10134(J)

thermal properties at high temperatures, 11: 327, 1527(R)

thermal properties of, bibliography, 11: 331

volumetric determination using Pb reductor, 11: 13581(R)

welding, effects of impurities on, 11: 4466(R)

welds in, ductility of tungsten arc, 11: 8936(J)

welds in, effects of N on soundness and ductility of, 11: 8937(J)

wetting by molten Pb or Bi, treatment for, 11: 3247(P)

x-ray-absorption determination in Mo–U alloys, 11: 5217

x-ray emission determination in U alloys, 11: 7408(R)

Molybdenum alloys

corrosion, 11: 7663(R)

mechanical properties, 11: 13339(R)

metallurgy of, book, 11: 9342(J)

Molybdenum–aluminum–chromium alloys
See Aluminum–chromium–molybdenum alloys.

Molybdenum–aluminum–chromium–iron–titanium alloys
See Aluminum–chromium–iron–molybdenum–titanium alloys.

Molybdenum–aluminum–iron alloys
See Aluminum–iron–molybdenum alloys.

Molybdenum–aluminum–titanium alloys
See Aluminum–molybdenum–titanium alloys.

Molybdenum carbides

chemical, physical, and mechanical properties, 11: 5856

Molybdenum carbonyls

preparation and properties, 11: 1011(J)

Molybdenum–chromium–iron alloys
See Chromium–iron–molybdenum alloys.

Molybdenum–chromium–iron–nickel alloys
See Chromium–iron–molybdenum–nickel alloys.

Molybdenum–chromium–iron–titanium alloys
See Chromium–iron–molybdenum–titanium alloys.

Molybdenum–chromium–iron–vanadium alloys
See Chromium–iron–molybdenum–vanadium alloys.

Molybdenum–chromium–nickel alloys
See Chromium–molybdenum–nickel alloys.

Molybdenum–chromium–nickel steel
See Chromium–molybdenum–nickel steel.

Molybdenum–chromium–silicon systems
See Chromium–molybdenum–silicon systems.

Molybdenum–chromium steel
See Chromium–molybdenum steel.

Molybdenum–chromium–titanium alloys
See Chromium–molybdenum–titanium alloys.

Molybdenum–chromium–uranium alloys
See Chromium–molybdenum–uranium alloys.

Molybdenum coatings

application to U slugs, techniques for, 11: 13789(R)

preparation by electrophoretic deposition, 11: 8514(R)

Molybdenum coatings (cont'd)

vapor deposition on stainless steel tubing, 11: 13782(R)

vapor deposition on U, 11: 13776

Molybdenum complexes

with EDTA, molecular structure, 11: 957(J)

solvent partition, 11: 11645

Molybdenum compounds

crystal structure of $Mo(PO_3)_3$, 11: 7955(J)

Molybdenum–copper–silicon systems
See Copper–molybdenum–silicon systems.

Molybdenum crystals

thermionic emission from planar, 11: 1920(R), 5369(R)

Molybdenum fluorides

separation from UF_6, 11: 9581(R)

separation from UF_6 by distillation, 11: 11596

Molybdenum–iron alloys
See Iron–molybdenum alloys.

Molybdenum–iron–nickel alloys
See Iron–molybdenum–nickel alloys.

Molybdenum isotopes Mo^{91}

decay schemes, 11: 1695(J), 13455(J)

Molybdenum isotopes Mo^{92}

neutron reactions (n,2n), cross sections, 11: 9140(J)

Molybdenum isotopes Mo^{95}

poisoning effects in thermal homogeneous reactor core, 11: 8601

Molybdenum isotopes Mo^{99}

occurrence in U^{235}, 11: 1641

Molybdenum isotopes Mo^{100}

neutron activation cross sections, 11: 9752(R)

Molybdenum isotopes Mo^{101}

decay schemes, 11: 550(R), 2026(R)

Molybdenum–nickel alloys

corrosion resistance, mechanical properties, and metallurgy, 11: 13325(J)

fabrication, oxidation rate, tensile properties, and welding, 11: 13786

mechanical properties, effects of alloying elements on, 11: 318

solubility in acid solutions, 11: 8487(R)

Molybdenum–niobium alloys

creep tests on, 11: 6408(J)

fabrication, mechanical properties, and high-temperature corrosion, 11: 5348(R)

Molybdenum–niobium–uranium alloys

corrosion, 11: 10986(R)

corrosion by water, 11: 8717(R), 8719(R), 11808(R), 13820

corrosion of, summary of data, 11: 11664

transformation kinetics of the γ solid solution, 11: 1121

Molybdenum ores

analysis for rhenium, 11: 8285(R)

refining, 11: 348(J)

Molybdenum oxides

catalytic effects for recombining radiolytic gases, 11: 4265

electron energy losses in reflections from, 11: 4524(J)

evaporation, gaseous species in, 11: 550(R)

Molybdenum–platinum–uranium alloys

corrosion, effects of aging on, 11: 8719(R)

corrosion by water, 11: 8717(R), 8720(R), 11808(R)

corrosion by water at 650°C, 11: 13820

corrosion of, summary of data, 11: 11664

metallurgy in fuel rod fabrication, 11: 11717

transformation kinetics of the γ solid solution, 11: 1121

Molybdenum–plutonium–uranium alloys

properties, 11: 7630(R)

Molybdenum–silicon–titanium systems

physical properties, 11: 3412(R)

Molybdenum steel

corrosion inhibitors for, 11: 10987(R)

hardness, heat treatment, and thermal and mechanical properties, 11: 8011

stress-corrosion tests of, in high-temperature waters, 11: 1865

Molybdenum sulfates

solubility, 11: 12584(R)

Molybdenum sulfides

lubricating properties, 11: 13969(R)

lubricity compared with graphite, 11: 5235(J)

Molybdenum–thorium alloys

arc welding, 11: 13770

mechanical properties, 11: 13339(R)

Molybdenum–thorium oxide systems

physical and mechanical properties, 11: 6713

Molybdenum–tin alloys

Van de Graaff radiography, 11: 2772

Molybdenum–tin–zirconium alloys

heat treatment and mechanical properties, 11: 5900(J)

Molybdenum–titanium alloys

coating and ductility, 11: 12749

electrical resistivity of β-phase, 11: 1904(J)

fabrication, mechanical properties, and high-temperature corrosion, 11: 5348(R)

heat treatment and mechanical properties, 11: 1169(J)

Molybdenum–titanium–uranium alloys

constitution of δ-phase, microstructure, thermal analysis, and x-ray-diffraction analysis, 11: 306

Molybdenum–uranium alloys

addition of Si to improve tensile properties, 11: 6589(P)

bibliographies of the fuel element program, 11: 11731

casting, effect on density and homogeneity, 11: 12502

casting and fabrication, 11: 13766

coating, development of barrier coat materials, 11: 8463

cold pressed casting for porosity elimination, 11: 13042

conductometric analysis for Mo, 11: 6657

constitution diagrams, 11: 6657, 8534, 11702(R)

constitution theory, 11: 12057

corrosion, 11: 7640, 8715(R), 10986(R), 11702(R), 11716, 13189(R), 13824

corrosion, effects of aging on, 11: 8719(R)

corrosion by boiling water, 11: 7665(R), 13818

corrosion by 650°F degassed water, effects of ternary impurity additions on, 11: 13740

corrosion by water, 11: 8716(R), 8717(R), 8718(R), 8720(R), 11808(R), 13779(R)

corrosion by water at 650°C, 11: 13820

corrosion of, summary of data, 11: 11664

corrosion resistance improvement over U metal, 11: 6588(P)

creep strength at 1500 to 1800°F, 11: 12630

crystal structure of gamma phase, 11: 5223

decontamination, 11: 8719(R)

dissolution, 11: 7509(R)

electric conductivity, 11: 6657

equilibrium diagram, 11: 13771

extrsuion development, 11: 8720(R)

fabrication, 11: 8715(R), 10986(R), 11806(R)

fabrication of spherical particles, 11: 7689

forging and rolling, 11: 9732

hardness, 11: 5702, 13740, 13771

heat treatment, 11: 5702

homogenization by neutron irradiation, 11: 5886

interfacial reactions, 11: 7640

mechanical properties, 11: 11702(R), 13516(J)

melting, 11: 8715(R), 8717(R), 10986(R)

metallurgy in fuel rod fabrication, 11: 11717

microstructure of, 11: 5702, 13740

phase changes in pile-irradiated, 11: 1711(J)

phase studies, 11: 311, 8715(R), 8717(R), 8718(R), 8720(R), 10986(R), 11703(R), 11716

Molybdenum–uranium alloys (cont'd)

phase transformations, 11: 10987(R)

physical properties, effects of radiation on, 11: 8719(R)

preparation, 11: 5702, 8716(R), 9732, 13824

preparation in a reduction bomb, 11: 12479

properties, 11: 11716

radiation damage in, theory, 11: 766(J)

radiation effects, 11: 8718(R), 8720(R), 10901, 11808(R), 13189(R), 13503(R), 13818

radiation effects on corrosion and dimensional stability, 11: 13820

radiation effects on resistivity, 11: 8715(R)

solubility of H in, 11: 13790(R)

spectrophotometric analysis for Mo, 11: 1447

stress effects on thermal stability, 11: 13189(R)

tensile properties, 11: 7665(R), 8719(R), 13782(R)

tensile properties at high temperatures, 11: 9711(R)

tensile tests, 11: 10987(R)

thermal cycling, 11: 5702, 11747(R)

thermal expansion, 11: 5702, 13790(R)

thermal rupture, 11: 9732

transformation kinetics of the γ solid solution, 11: 1121

transformation hysteresis in, 11: 311

Van de Graaff radiography, 11: 2772

welding, 11: 12472

x-ray-absorption analysis for Mo, 11: 5217

x-ray-diffraction analysis, 11: 13771, 13790(R)

Molybdenum–uranium alloys (clad)

corrosion, 11: 7640

corrosion by high temperature water, 11: 13818

corrosion by 650°F degassed H_2O, 11: 8715(R)

corrosion by water, interdiffusion with Zircaloy-2, and radiation effects, 11: 11806(R)

corrosion testing of fuel elements, 11: 10987(R)

eddy-current inspection of fuel element, 11: 7728

extrusion, 11: 11715(R), 13814

fabrication, 11: 8717(R), 8534

fabrication techniques, 11: 10987(R)

grain structure, 11: 8534

radiation stability and corrosion during PWR operation, 11: 8712

Molybdenum–uranium alloys (liquid)

high-temperature reactions with H_2O, 11: 3834(R)

Molybdenum–uranium alloys (Zr alloy clad)

coating removal, 11: 10820(R)

corrosion in high temperature H_2O and steam, 11: 13323

Molybdenum–uranium alloys (Zr alloy clad) (cont'd)

extrusion and production of rods, 11: 8535

extrusion process and tooling specifications, 11: 8537

fabrication of fuel rods by drawing co-extruded round rods, 11: 8539

fabrication of fuel rods of, for metallurgy experiments, 11: 13811

fabrication techniques and irradiation in MTR, 11: 11721

hot straightening by stretching, 11: 8536

Molybdenum–uranium oxide compacts

creep strength at 1500 to 1800°F, 11: 12630

Molybdenum–uranium–zirconium alloys

corrosion by 680°F water, 11: 6351

Molybdenum–vanadium steel

creep, grain structure, and rupture investigation, 11: 8008

Molybdenum–zirconium alloys

creep and rupture behavior, 11: 1524

Moments

See Electric moments; Nuclear electric moments; Nuclear magnetic moments.

Monazite deposits

prospecting for, in Alaska and northwestern, western, and southeastern U.S., 11: 3825

Monazite deposits (Idaho)

occurrence in Beaver Creek Placer Area, 11: 3822

occurrence in Big Creek Placer Area, 11: 4437

occurrence in Boise Basin, 11: 4865

occurrence in Corral Creek Placer Area, 11: 3823

occurrence in Pearsol Creek Area, 11: 4866

occurrence in Scott Valley and Horsethief Basin areas, 11: 4438

Monazite deposits (N. C.)

occurrence in Sandy Run Creek Area, 11: 4436

Monazite deposits (S. C.)

occurrence in Big Generostee Creek Area and North and South Rabon Creek Areas, 11: 5315

occurrence in Broad River and Thicketty Creek Areas, 11: 4864

occurrence in the Tygre River Placer Area, 11: 3820

Monazite deposits (Wyo.)

occurrence in Deadwood Formation in Bald Mountain Area, 11: 5316

Monazites

(See also Black sands; Thorium ores; Uranium ores.)

analysis, 11: 11586(R)

acid leaching, for U and Th recovery, 11: 8329(R)

age determinations with, 11: 4867(J)

analysis for thorium and lanthanons, 11: 6658(J)

analysis for Th and rare earths, 11: 5208

Monazites (cont'd)

caustic leaching for U and Th recovery, 11: 8327(R), 8330(R)

dissolution and separation of U and Th, 11: 8328(R)

lead–uranium ages, additional regularities among discordant, 11: 7998(J)

organic leaching for Th extraction, 11: 11647(R)

process for recovery of Th, U, and rare earths from, 11: 11625

processing, Th and U separation by ion exchange and solvent extraction, 11: 13634

processing for Eu oxide, 11: 13631

processing for recovery of U, Th, and Ti, 11: 8326(R)

processing for Th and U recovery, 11: 2327(R), 7428(R), 7469, 7571(R), 11598, 12360(R)

processing for thorium recovery, 11: 3367(J), 12971(R)

processing of, for U, 11: 7675

recovery of Th from, by HNO_3 digestion, 11: 11597

spectrophotometric analysis for Th using iodate precipitation, 11: 6263(J)

thorium and uranium recovery from, by solvent extraction, 11: 8325

thorium recovery from, 11: 8510(R), 13669(R)

x-ray study of single crystal, 11: 1207(J)

Monel metal

See Nickel alloys.

Monitoring

See Radiation monitoring.

Monkeys

lethal x radiation dosage determinations, 11: 6602(J)

radiosensitivity, effects of AET, 11: 7076(J)

radiostrontium retention and excretion, 11: 11881(J)

respiratory pattern in, effects of whole-body exposure to γ radiation, 11: 6606(J)

Monomolecular films

formation on metal surfaces, gas clean-up effects on, 11: 2959(J)

Monsanto Chemical Co., Dayton, Ohio

progress reports on high-temperature hydraulic fluids, 11: 3370(R)

Montana

exploration for Th and radioactive black mineral deposits, 11: 3825

mineral determinations in U deposits in, 11: 5317

uranium deposits, collected field material on, 11: 6356(R)

uranium occurrence in black shale deposits of, 11: 3409(J)

uranium possibilities in Eastern and Central, 11: 7996(J)

Montana (Jefferson Co.)

geology of Lone Eagle mine in, 11: 2908(J)

Monte Carlo method

(See also Mathematics; Statistics.)

application to numerical solution of the potential equation, 11: 12135

applied to studies of γ penetration through lead and polyethylene slabs, 11: 2162

Monte Carlo method (cont'd)

approximations to circular normal distribution for analog computers, 11: 2588

description and demonstration, 11: 6806(J)

general purpose code on neutron behavior, 11: 3475

multidimensional integrals in, 11: 12137(J)

nature of, 11: 9389

neutron flux distributions in EBR and Los Alamos Fast Reactor calculated by, 11: 7707

programming for computer, 11: 8993(J)

resonance phenomena studies, 11: 11728(R)

statistical tests for pseudo-random numbers, 11: 2590

symposium, 11: 5434(J)

techniques and applications, 11: 5427

Montmorillonites

(See also Bentonites.)

adsorptive properties for U, 11: 1489

granular, properties, 11: 13305

Monument Mines (Ariz.)

structural control of U ores in, 11: 4443(J)

Moore Claims (Wyo.)

geology, 11: 12734

Morin

colorimetric reagent for determination of Th in urine, 11: 1445

Morphine

labeled with C^{14}, radiation dosage determination following injection in man, 11: 10423

preparation of labeled, using C^{14}-ion beam, 11: 4814(R)

synthesis and biosynthesis, 11: 4814(R)

Morrison Formation (N. Mex.)

stratigraphy, relationship of members of, 11: 2910(J)

Mossback member (Utah)

comparison of pebbles of, and Shinarump member of the Chinle formation, 11: 10543(J)

Motor vehicles

See Vehicles.

Motors

(See also Laboratory equipment; Rocket motors.)

cooling canned rotor, with kerosene and transformer oil, 11: 2454

design of low-speed rotary, for sealed systems, 11: 4408

design of slow speed reluctance, for control rod drives, 11: 6702(J)

radiation effects, procedures for determining, 11: 2181

Mound Lab., Miamisburg, Ohio

progress reports, 11: 11646(R), 12328(R)

progress reports on biology, 11: 2245(R)

progress reports on liquid waste disposal, 11: 7594(R), 8435(R)

Mount Peale Quadrangle (Colo.–Utah)

photogeologic map, 11: 1092(J), 1093(J), 9314(J), 9315(J)

Mount Peale Quadrangle (Colo.–Utah) (cont'd)

preliminary geologic map, 11: 10545(J), 10546(J)

Mount Peale Quadrangle (Utah)

photogeologic map, 11: 1090(J), 1091(J), 1100(J)

Mouth

radiosensitivity in mice, 11: 859(J)

tumors of lip, radiotherapy with Co^{60} applicator, 11: 6623(J)

MTR

See Materials Testing Reactor.

Multiplication factor

(See also Criticality studies.)

calculation, 11: 11730

calculation for double grid fuel elements, 11: 12904(J)

calculation of f, p, ϵ, and η for reactors, 11: 8702

effects of reaction products on regeneration factor of Th^{233}–U^{235} reactors, 11: 9787

measurement of f, p, and ϵ for UO_2-fueled TRX lattices, 11: 11434

neutron interaction effect, 11: 9073(J)

pile constant calculations, 11: 4013(R)

variation of η during lifetime of slightly enriched U reactors, 11: 10918

Muscles

morphology of uterine, 11: 12642(R)

Muscovites

grinding, resistance to, 11: 6237(R)

ion exchange properties, 11: 6237(R)

Mutations

induced in yeast by exposure to cold and x radiation, 11: 862(J)

induction in plant breeding, 11: 5130

in man, review, 11: 11862(J)

radioinduced, 11: 44(J), 5753(J)

radioinduced, in animals and plants, 11: 875(J)

radioinduced, in Drosophila, 11: 844(J), 5148(J), 5149(J), 6605(J)

radioinduced, in Drosophila by ingested P^{32}, 11: 4240(J)

radioinduced, in mice, 11: 1744(J), 5157(J), 8774(J)

radioinduced, in humans, theory, 11: 9955(J)

radioinduced in bacteria, 11: 3479(R)

radioinduced in Habrobracon, 11: 5147(J)

radioinduced in jute plants, 11: 11875(J)

radioinduced in maize, 11: 13239(J)

radioinduced in Neurospora, 11: 34(J)

radioinduced in plants, 11: 17(J), 8762

radioinduced in wheat, 11: 1399

radioinduced in yeast, 11: 11843

radioinduced somatic, in mice, 11: 11855(J)

N

Nagasaki

genetic effects of exposure to atomic bombs on populations of, 11: 3294(J)

Nairi Basin (Belgian Congo)

geology, study of ore deposits and sediments of, 11: 1081

Naphthalene

hydrogen exchange between derivatives of, and DBr, 11: 1793(J)

luminescence changes in organic solids, applications to dosimetry, 11: 9409(J)

radiation damage and thermal decomposition, 11: 12331(R)

Naphthalene crystals

production method for phosphor, 11: 3636(P)

Naphthalene, 1,2,3,4-tetrahydro-

radiation effects, 11: 4163

radiation effects and cooling properties, 11: 7848(R)

radiolysis by γ radiation, 11: 7429(R)

reactions with hot liquid sodium, 11: 3682

Naphthalenes

isomerization of C^{14}-labeled perinaphthene, 11: 8824

radiation effects, 11: 12984, 12985

radiation effects on luminescence emission, 11: 4614(R)

1-Naphthol, 2-nitroso-

complexes with metals, formation constants, 11: 4301(J)

National Bureau of Standards, Washington, D. C.

progress reports, 11: 7694(R)

progress reports on electrodeposition of Ti, 11: 1137(R)

progress reports on isotope separation by molecular distillation, 11: 7703(R)

progress reports on reference electrodes for fused salts, 11: 10431(R), 10432(R), 10434(R)

Natural waters

(See also Ground waters; Surface waters.)

analysis for trace amounts of U, method for, 11: 5290(J)

geochemical exploration for U in, 11: 10084(R)

geochemical prospecting for underground uranium by content of Kr^{85} in, 11: 8939(J)

Navajo Mountain Quadrangle (Ariz.-Utah)

photogeologic map, 11: 1101(J), 1102(J), 5323(J), 5324(J), 5869(J)

Navajo Mountain Quadrangle (Utah)

photogeologic map, 11: 1117(J)

Naval Ordnance Lab., Corona, Calif.

progress reports on dielectric materials, 11: 3768(R)

Naval Ordnance Lab., White Oak, Md.

progress reports on NOL reactor vessel containment program, 11: 11171(R)

Naval reactor power plants

economic factors and design studies, 11: 3(J)

performance and maintenance for surface vessel, comparison with oil-fired, 11: 13980(R)

Naval reactors

(See also Carrier Vessel Reactor; Submarine Advanced Reactor; Submarine Fleet Reactor; Submarine Intermediate Reactor; Submarine Reactors (S1C); Submarine Reactors (S5W); Submarine Thermal Reactor.)

design considerations and problems, 11: 5606(J)

hazards from normal marine accidents to merchant ships powered with, 11: 5571

Naval Research Lab., Washington, D. C.

progress report on nuclear science and technology, 11: 1277(R), 4614(R), 6865(R), 12068(R)

Naval vessels

nuclear powered, development, 11: 10389(J)

nuclear-powered, radiation hazards, 11: 6616(J)

Nebraska. Univ., Lincoln

progress reports on scintillation response of crystals, 11: 5436(R)

Negative protons

See Antiprotons.

Negatrons

See Beta particles.

Neodymium

(See also Rare earths.)

electric conductivity and phase studies as a function of temperature, 11: 10359(J)

heat of vaporization and melting point, 11: 1471

ion exchange using ENTA, 11: 6302(J)

isotopic shift in 4450 to 6500 A area, analysis, 11: 3212(J)

liquid metal extraction from Cr–U alloys, 11: 7677(R)

magnetic measurements, 11: 8117(R)

magnetic susceptibility from 1.5 to 300°K, 11: 9171(J)

neutron reactions, 11: 12963(R)

neutron total cross sections at 14 Mev, 11: 2026(R)

optical constant determination visable and infrared, 11: 13552(J)

physical and chemical properties, 11: 5816(J)

spectrographic determination in Mg, 11: 3705(J)

spectrophotometric determination in Nd–Y mixtures, 11: 1443

Neodymium complexes

with thiourea, 11: 10031(J)

Neodymium crystals

magnetic properties, 11: 8045(J)

Neodymium fluorides

crystallographic data, 11: 6431(J)

preparation from Nd_2O_3, 11: 7673(R)

Neodymium(III) ions

crystalline field interactions in crystals with bromate and ethylsulfate, 11: 10007(J)

paramagnetic resonance, 11: 817(J)

Neodymium isotopes

gamma spectra, 11: 11740(R)

long lived, search for, 11: 6866(R)

neutron resonances, 11: 9448(J)

Neodymium isotopes Nd^{149}

gamma spectra, formed in a spallation reaction, 11: 12941

Neodymium isotopes Nd^{147}
decay schemes, 11: 1278(R)
nuclear alignment, 11: 6519(J)
purification method, 11: 9869(R)
Neodymium nitrates
thermolysis, 11: 972(J)
Neodymium oxides
catalytic properties, 11: 4353(J)
Neodymium sulfates
deposition in homogeneous reactor processing loop, 11: 12993(R)
precipitation during hydroclone operation, 11: 7417(R)
precipitation on hot metal, 11: 7859(R), 9869(R)
solubility in HRT fuel solution, 11: 7859(R), 9869(R)
solubility in H_2O and Na_2SO_4 solutions at high temperatures, 11: 5757
Neon
crystal structure of solid, 11: 9054(R)
electron diffusion in afterglow of microwave discharge, 11: 1920(R)
exchange hole distribution, size, and shape in atoms, 11: 2091(J)
excitation of fast He atoms by, 11: 5064(J)
fast neutron scattering in energy region 1.9 to 3.5 Mev, 11: 8146(J)
large angle collisions with Ne and Ar, measurement, 11: 12763(J)
scattering by Ar, 11: 742(J)
scattering of low-energy H^- ions in, 11: 9501(J)
sparking potential at low pressures, 11: 7231(J)
thermal conductivity of Ne–Ar and Ne–Kr mixtures, 11: 6778(J)
wave functions for, 11: 11254(R)
Neon ions
charge exchange and scattering in Ne and He, 11: 445
electron capture and ionization in collision of singly charged, with atoms of rare gases, 11: 3200(J)
gas ionization by positive, with formation of multi-charged ions by single collision, 11: 3201(J)
Neon isotopes
nuclear reactions in stars, 11: 5379(J)
relative abundance, 11: 1973(J)
Neon isotopes Ne^{19}
beta decay, electron-neutrino angular correlation, 11: 4049(J), 4647(J)
half life, 11: 4747(J)
primary excited states, 11: 10624(J)
Neon isotopes Ne^{20}
cobalt^{59} reactions, products from, 11: 4123(J)
energy levels, 11: 1542(R), 1680(J), 10325(J)
energy levels, search for transition between 3^- state at 7.18 Mev and 2^+ state at 1.63 Mev, 11: 5001(J)
energy levels from $Na^{23}(p,\alpha)$ reaction, 11: 9457(J)
formation by α capture in core of stars, 11: 3889(J)
Neon isotopes Ne^{21}
nuclear magnetic moment, 11: 13466(J)
spin, magnetic moment, and quadrupole moment, 11: 1645(J)
Neon isotopes Ne^{23}
decay, 11: 4747(J), 8221(J)
Neon isotopes Ne^{25}
abundance, 11: 1973(J)
NEPA reactors
See Aircraft reactors.
Nephelometers
design for in-process, organic solvent-water analysis, 11: 5947
Nephelometry
effect of particle shape in, 11: 3704(J)
Neptex Process
decontamination, 11: 8288(R)
solvent extraction and ion exchange of Np^{237} from Purex waste, 11: 11576(R)
Neptunium
absorption spectra in aqueous solution, 11: 11586(R)
analytical chemistry of, review, 11: 10494(J), 12713(J)
chemical properties and determination, 11: 2831
crystal structure, 11: 8562(R)
fused salt extraction from U, 11: 8387(R)
ion exchange, fission fragment analysis, 11: 3702
oxidation–reduction states, 11: 13633(R)
physical properties, 11: 7207(J)
recovery, 11: 8283(R)
recovery from Canadian tank-car U solution and extraction in ORNL metal process program, 11: 8288(R)
recovery from metal waste by Purex Process, 11: 8286(R)
recovery from Purex wastes, 11: 11576(R)
recovery from U waste solutions, 11: 8400
selective solvation and dielectric saturation as related to electron exchange reactions of $Np^{5+}-Np^{6+}$, 11: 6650(J)
separation from plutonium by chloride distillation, 11: 7466
solvent extraction, 11: 12585(R)
solvent partition on Dowex in H_2SO_4, 11: 8288(R)
thermodynamic properties, 11: 9578(R)
Neptunium carbides
crystal structure, 11: 8562(R)
Neptunium chlorides
vapor pressure, 11: 11563(R)
Neptunium compounds
magnetic susceptibilities, 11: 8265(R)
preparation of Np^{5+}, 11: 13577(R)
Neptunium fluorides
magnetic susceptibility, 11: 12076(J)
Neptunium foils
neutron flux measured by, and preparation of, 11: 11746(R)
Neptunium ions
chemical reactions in sulfate media, kinetics, 11: 10492(J)
isotopic exchange in $Np^{5+}-Np^{6+}-D_2O$ system, 11: 10490(J)
measurements on Np(IV)–Np(V) couple, 11: 8267(R)
Neptunium(IV) ions
oxidation by Fe^{3+} in HNO_3 solutions, 11: 13577(R)
Neptunium(V) ions
hydrolytic behavior, 11: 12330(R)
Neptunium(VI) ions
hydrolytic behavior, 11: 12330(R)

Neptunium isotopes

thermal neutron cross sections, review, 11: 10245

Neptunium isotopes Np^{234}

decay scheme, 11: 9591(R)

Neptunium isotopes Np^{235}

fission and spallation competition, 11: 3578

Neptunium isotopes Np^{238}

decay scheme, 11: 9591(R)

Neptunium isotopes Np^{237}

alpha emission, angular distribution of, 11: 4016(R)

alpha reactions and fission-spallation competition from Am^{241}, 11: 3578

alpha spectra, 11: 3371(J)

energy levels, 11: 10762(J)

energy levels from U^{237} beta decay, 11: 10760(J)

fast neutron cross sections, 11: 11564(R)

fission and spallation competition, 11: 12268

gamma spectrum, 11: 8266(R)

half life of metastable state arising from Am^{241} decay, 11: 7406(R)

neutron total cross sections in the 0.02 to 3 ev region, 11: 2624, 8140, 11371(J)

recovery from gaseous diffusion plant ash, 11: 13652(R)

recovery from Redox raffinate, 11: 13636

separation and determination by liquid-liquid extraction, 11: 9620

separation from Hanford Pu waste solutions, 11: 7467

spectrographic analysis, effect of B and U on, 11: 2624

spontaneous fission energy release, calculated, 11: 13444

yields by (n,2n) reaction on U^{238}, 11: 8288(R)

Neptunium isotopes Np^{236}

spontaneous fission energy release, calculated, 11: 13444

Neptunium isotopes Np^{239}

beta decay, energy levels of Pu^{239} studied by, 11: 6049(J)

counting efficiency of various instruments for, 11: 8844(J)

decay schemes, 11: 2027(R), 6494(R)

disintegration energies, 11: 8265(R), 13197(R)

disintegration rate determination, 11: 4388

paramagnetic resonance hyperfine structure, 11: 10263(J)

separation and determination by liquid-liquid extraction, 11: 9620

separation of trace amounts from reactor effluent water, 11: 11121

thermal neutron cross section effects on Pu^{240} to Pu^{239} ratio in nautral U reactors, 11: 6090

Neptunium sulfides

lattice dimensions and density of Np_2S_3, 11: 8543(R)

Nerve cells

development in chick embryo tissue cultures, effects of irradiation, 11: 863(J)

Nerves

radiation injuries of, regeneration in salamander larvae, 11: 5169(J)

Nervous system

(See also Brain; Nerve cells; Spinal cord.)

effects of lethal doses of radiation on, of rabbits, 11: 7058(J)

Nervous system (cont'd)

effect of localized brain stem lesions and supradiaphragmatic vagotomy on x-irradiation emesis in monkeys, 11: 4232(J)

histopathology at various states of radiation injury, 11: 6198(J)

radioinduced injuries to, of fowls, 11: 11032(J)

radioinduced olfactory disturbances in people, 11: 7057(J)

radiosensitivity, effects of various drugs in mice, 11: 5167(J)

response during irradiation, 11: 8782(J)

spinal reflex activity, effects of local x irradiation, 11: 3648

stimulation of the olfactory bulb in rabbits, 11: 16(J)

temperature control centers, radiosensitivity in rabbits following vaccination with pyrogenic organisms, 11: 851(J)

total x-radiation effects on, reflexes, 11: 2783(J)

Netherlands

basis and economic perspective of atomic energy for, 11: 11835(J)

future production of atomic energy in, 11: 11836(J)

NETR

See Air Force Engineering Test Reactor.

Network analyzers

See Computers.

Neurology

membrane properties, 11: 8025(R)

Neurospora

radioinduced mutations, 11: 34(J)

Neutrinos

(See also Antineutrinos.)

composite particles of zero mass, theory, 11: 10383(J)

detection techniques, 11: 5499(J), 8114(J)

effect on disintegration of deuterons, 11: 4028(J)

emission in beta decay, theory, 11: 12935(J)

equivalence theorem for, 11: 10378(J)

existence, photographic evidence for, 11: 9012(J)

formation from π^+ decay in flight dynamics, 11: 548

health hazard from emission of, from Hanford Production Reactors, 11: 12518

identity with antineutrinos, test for, 11: 8126(J)

invariance in measurement of field of, 11: 12074(J)

magnetic moment upper limit, 11: 11372(J)

mass and parity conservation in decay, 11: 5508(J), 7303(J)

mass and parity non-conservation, 11: 9084(J)

μ-meson decay and the two-component, 11: 6987(J), 9424(J), 11341(J)

physics of, survey, 11: 13433(J)

review of work on, 11: 6505(J), 9053

theory, reformulation of the Majorana, 11: 10796(J)

theory of weak interactions, 11: 12848(J)

two-component theory, and K-meson decays comprising two neutrinos, 11: 8413(J)

two-component theory of, and parity nonconservation, 11: 6016(J), 8124(J), 10692(J), 10778(J)

Neutron-absorption analysis

study of, and its application to determination of boron, 11: 11078, 11579

thermal utilization in, 11: 12563

Neutron absorption cross sections
See Neutron capture cross sections.

Neutron activation analysis
See Activation analysis; Radiometric analysis.

Neutron activation cross sections
graphs, 11: 10248(J)
measurement for 50 nuclei, 11: 9189(R)
of nuclei, at 25 kev, 11: 11370(J)
survey of data on, 11: 4973
tables, 11: 10247
values for Al, V, Mn, Cu, Zn, Rh, Ag, In, Pt, and Au, 11: 11739(R)

Neutron beams
albedo of non-stationary, 11: 12184(J)
characteristics of 60-in.-cyclotron, 11: 8259(R)
depth-dose curves, 11: 52(R)
production of polarized, 11: 8113(J)

Neutron capture cross sections
(See also Capture-to-fission ratios.)
calculation, 11: 1618(R)
determination by spherical shell method, sensitivity, 11: 4629
measurement, apparatus for, 11: 7025(P)
measurement of Mn, Zr, Ag, In, Sm, Eu, Gd, and Dy with Dimple pile oscillator, 11: 7309
measurement of thermal, using spherical symmetry, 11: 12199(J)
measurement of various natural elements and enriched isotopes, in ZEPHYR, 11: 9116(J)
multigroup cross sections for resonance absorbers, mathematical analysis, 11: 2627
reduction by self absorption and Doppler broadening, 11: 2625
tables, 11: 12810

Neutron choppers
See Neutron spectrometers.

Neutron cross sections
(See also specific neutron cross sections, e.g., Neutron capture cross sections.)
for air, machine calculations, 11: 7310
applications in reactor technology, 11: 3560(J)
bibliographies, 11: 5488
calculation, 11: 12284
curves, thermal, and resonance parameters, 11: 8137
determination by optical nuclear model, 11: 583(J)
digital computing equipment for processing data, 11: 6459
of elements at 14.5 Mev, 11: 5559(J)
energy dependence of parameters, 11: 12853
of heavier odd elements in kev region, 11: 4047(J)
for heavy isotopes, review, 11: 10245
of Mg, Si, and S, 11: 1287
measurement, 11: 550(R)
measurements, by the AEC advisory group, 11: 13858
measuring techniques for elastic and non-elastic, 11: 1654(J)
by multi-group reactor code method for computer, 11: 9096
research program summaries, 11: 5535
research programs of the NCSAG, 11: 13116

Neutron cross sections (cont'd)
tables, 11: 6505(J)
tables, for reactor materials, 11: 594
tables for nuclides exposed to neutrons moderated by water or D_2O, 11: 6508
techniques for measuring elastic and inelastic, 11: 8162(J)
techniques for measuring elastic, inelastic, and transport, 11: 590(J)
theory, 11: 591(J)
total, for K^{39}, K^{41}, and Rb^{87}, 11: 9189(R)
values for U^{233}, U^{235}, and Pu^{239}, basis of, 11: 8141

Neutron decay
angular correlations, 11: 1278(R)

Neutron-diffraction analysis
applications to solid state problems, 11: 6426(J)
methods of magnetic, at low temperatures, 11: 4016(R)
of molecular structure, 11: 9429(J)
research program in U.S., 11: 591(J)
of vitreous silica glass, 11: 4639(J)

Neutron fission
See Fission.

Neutron fission cross sections
(See also Capture-to-fission ratios.)
energy variation of η for U^{233}, U^{235}, and Pu^{239}, 11: 2066(J)
as function of Z^2/A for heavy nuclides, 11: 9775
measurement in EBR, 11: 11746(R)
measurement methods, 11: 4034, 10231(R), 11745(R)
reduction by self absorption and Doppler broadening, 11: 2625
values for Am, Np, Pa, Pu, Th, and U isotopes, 11: 10697

Neutron monochromators
mechanical, for filtering higher order coherent scattered neutrons and tests on gold cross sections, 11: 1219

Neutron photography
techniques and applications, 11: 256(J)

Neutron Production Reactor
(See also Argonne Neutron Production Reactor; Neutron Production Reactor Experiments.)
buckling, calculations, 11: 8547(R)
cooling system shielding, 11: 13220
design, effect of buckling experiments on, 11: 1326
exponential experiments of, 11: 7845(R)
matrices, 11: 1326
shielding, 11: 13220, 13963

Neutron Production Reactor Experiments
design studies for NAA, 11: 2719
neutron flux distribution in NAA, 11: 2719

Neutron removal cross sections
See Neutron capture cross sections.

Neutron resonance cross sections
computation for dry graphite–uranium rod lattices, 11: 2686
Doppler effects on, 11: 9770

Neutron scattering cross sections
analysis of data on, for fission-spectrum neutrons, 11: 4986(J)

Neutron scattering cross sections (cont'd)

calculations, 11: 6856

data analysis for potential well model, 11: 7285

inelastic, determination of, 11: 2067(J)

inelastic, for elements used in fact reactors, 11: 10910

mathematical analysis, 11: 8562(R)

measurement, 11: 8562(R)

prediction of, from (γ,f) and (γ,n) cross sections, 11: 9775

survey of experiments on inelastic, for fission-spectrum neutrons, 11: 4982(J)

tables, 11: 10247

for uranium, Bi, Pb, Hg, W, Sb, Sn, Cd, Cu, Ni, Fe, Al, and Na, 11: 4155(J)

values for 14-Mev neutrons by Pb and Bi scatterers, 11: 10231(R)

Neutron shielding

conical, mathematical analysis of attenuation in, 11: 7707

design for LMFR, 11: 1222, 12221

effect in reducing backscattering from test material, 11: 1669(J)

leakage enhancement by internal voids, 11: 13216

liquid, containing randomly packed pellets, effect of γ-rays on, 11: 2767

materials, 11: 13218

mathematical design study, 11: 13212

neutron capture in, reduction by B additions, 11: 7891

thickness of B^{10}, for Pu capture-to-fission ratio experiments, 11: 14035

Neutron sources

(See also Reactor thermal columns; Water boiler neutron sources.)

calibration, 11: 11739(R), 13838(R)

calibration for irradiation of biological material, 11: 3950

calibration of, at the BNL shielding facility, 11: 11822

calibration procedures for Ra–Be, 11: 2759, 3520(J)

design, 11: 2779(R), 8562(R)

design and handling of Sb–Be, 11: 1475(R)

design using delayed neutrons, 11: 7027(P)

determination of neutron intensity and γ spectrum, 11: 13517(J)

gamma and neutron emission, 11: 482, 6825(J)

handling facilities for HRT, 11: 10951

neutron amplifier, design, 11: 12767(J)

neutron spectra of Po–Be, 11: 1618(R), 3028

neutrons emitted per unit of time by standard Ra–Be, 11: 2190(J)

preparation and calibration of, conference on, 11: 5489

preparation of Pu–Be, by powder techniques, 11: 4606

pulsed, application to absorption and diffusion measurements and reactor buckling, 11: 10315(J)

pulsed, application to criticality measurements, 11: 9432

radiation dosage measurements from Pb-shielded Sb-Be, 11: 4179

reactivity effects in subcritical reactor. 11: 10302

for reactor startup, comparison, 11: 10961

rupture, control and decontamination, 11: 13571(R)

source intensity determination of Be-photo- and Ra–Be, 11: 2020(J)

spectra and yield for (α,n), 11: 12182

spectrum of actinium-beryllium, 11: 9047(J)

standards, calibration, production, and properties, 11: 6571

Neutron sources (cont'd)

survey, 11: 12087(J)

time behavior of the strength of Po–Be and photo-, in APPR, effect of Po decay and Po and Be burnup, 11: 2102

yield from Rn–Be and Ra–Be, 11: 11347(J)

Neutron spectra

analysis of Breit-Wigner resonance of, 11: 12504(R)

bibliographies, 11: 5488

characteristics of, in H_2O–U lattices, 11: 5598

from deuteron-deuteron reactions between 4.75 and 7.33 Mev, 11: 3006

from deuteron reactions with T, He^3, He^4, Li, Be, B, C, and Cu, 11: 4129(J)

energy calculations for infinitely multiplying media, 11: 9431

energy distribution, effect of finite resolution corrections, 11: 2018

experimental and theoretical, comparison, 11: 8112(J)

of inelastically scattered neutrons from elements used in fast reactors, 11: 10910

integration of U^{235} fission, 11: 4216(J)

measurement, using Li^6 loaded emulsions, 11: 12157(J)

measurement by variation in electric conductivity of graphite, 11: 9889

measurement of, emerging from a fast reactor at 0.4 to 15 Mev, 11: 12210

measurement of, from U target bombarded with 190 Mev deuterons, 11: 8566

measurements at CP-5 animal exposure chamber, 11: 12642(R)

from reactions Be^9(d,n) and B^{11}(d,n), 11: 9189(R)

from uranium^{233} fission, determination, 11: 2622

Neutron spectrographic analysis

See Neutron spectroscopy.

Neutron spectrometers

application of magnetic recording to neutron time-of-flight, 11: 12153(J)

collimator design for, high-resolution Soller slit, 11: 14037

crystal and chopper, design, 11: 7826(R)

design and operation of crystal-type, and velocity selectors, 11: 551

design and operation of single crystal, 11: 13387

design and use of, at Saclay pile, 11: 498(J)

design of, based on slowing down time in Pb, 11: 590(J)

design of high-intensity, high-resolution velocity, 11: 3951

design of medium-energy, time-of-flight, 11: 6838(J)

design of pulsed source and time-of-flight, 11: 590(J)

design studies on time-of-flight, using chopped proton beams, 11: 6162

development, studies of usable reactions, 11: 1618(R)

development of ANL, 11: 550(R)

development of He^3, 11: 550(R)

development of LiI crystals for, 11: 484, 4568

equipment for use with Saclay Reactor, 11: 682(J)

filters for single crystal, 11: 1273(R)

gas filling system of He^3 fast, 11: 10172

instrumentation of ANL time-of-flight, 11: 10231(R)

instrumentation of MTR fast chopper, 11: 13430(R)

mechanical monochromator for crystal, 11: 1273(R)

modification of the Brookhaven fast chopper, 11: 5678(J)

modifications to Nevis velocity selector, 11: 1274(R)

performance improvements, 11: 9752(R)

Neutron spectrometers (cont'd)

pulse generator designed for use with, 11: 4534

scintillation detectors as, 11: 5964

silicon calibration standard, 11: 10232(R)

for studying velocity distribution of neutrons by time-of-flight method, 11: 9434(J)

time analyzer system of 128 intervals power supply and detecting system, 11: 1273(R)

time-of-flight, 11: 3257(P)

Neutron spectroscopy

with continuous methods, 11: 590(J)

by means of a ranging device, 11: 3028

proton recoil proportional counter for, 11: 6829(J)

time-of-flight, Gatlinburg conference notes on, 11: 10229

by time-of-flight device, 11: 3257(P)

use of time-of-flight analyses in 1- to 50-kev energy region, 11: 7713

Neutron total cross sections

of carbon, Be, F, Co, and Ge from 3.8 to 8.1 Mev, 11: 4046(J)

determination of average, of heavy elements at low energies, 11: 4651(J)

measurement at 14.8 Mev, 11: 9048(J)

of N^{15} in energy range 2.8 to 3.3 Mev, 11: 603(J)

for palladium, Os, Ir, Mo, In, I, Ta, Th, and U^{238} in, 11: 9078(J)

Neutrons

(See also Cosmic neutrons; Delayed neutrons; Fast neutrons; Neutron beams; Neutron sources; Photoneutrons; Resonance neutrons; Thermal neutrons; Antineutrons; Prompt neutrons.)

absorption, effects of neutron angular anisotropy at the boundary of a black region, 11: 2617

absorption and multiplication in two-group theory, 11: 682(J)

absorption by matter, 11: 256(J)

absorption cross sections at 2.5 and 4.3 Mev, 11: 2024(J)

absorption of epithermal, in thermal absorbers, 11: 7328(R)

age calculations in diphenyl– metal mixtures, 11: 13856

age-diffusion equation, three-space-dimensional multigroup derivation, 11: 10911

age in hydrogenous mixtures, calculation, 11: 10914

age of fission, in U–H_2O lattices, 11: 8564

amplifier for, design, 11: 12265(J), 12767(J)

angular correlation of fission, 11: 591(J)

angular distribution and energy spectra of, from reactions $B^{10}(d,n)C^{11}$ and $N^{14}(d,n)O^{15}$, 11: 715(J)

angular distribution from high-energy fission of U by protons, 11: 3098(J)

angular distribution from U bombarded with 190-Mev deuterons, 11: 13838(R)

angular distribution of ground state, from reaction $B^{11}(d,n)C^{12}$, 11: 8194(J)

angular distributions and excitation curves of resolved, from Be(α,n) reaction, 11: 5048(J)

angular distributions of scattered, 11: 13459(J)

angular flux computer, operation of Nupak, 11: 1233

angular momentum and spatial distribution in nuclei, effect of density distribution, 11: 2211(J)

attenuation, pulsed technique for studying, 11: 6005

attenuation and spectrum from shielding tank, 11: 7734(R)

attenuation in conical shield, mathematical analysis, 11: 7707

Neutrons (cont'd)

attenuation in Fe, 11: 4007

attenuation in non-scattering absorbers, 11: 11462

attenuation in water, 11: 13197(R)

attenuation in water-iron shield calculated by integral network theory, 11: 5677

attenuation of 14.1-Mev, in water, 11: 6858(J)

attenuation theory, 11: 2768

behavior, Monte Carlo code for, 11: 3475

beta decay, 11: 591(J)

beta decay, symmetry properties of, 11: 10231(R)

binding energy in heavy nuclei, variation, 11: 4068(J)

cataracts induced in laboratory animals following exposure, 11: 871(J)

charge, effect of electric field on, 11: 2025(J)

collisions with protons at Cosmotron energies, meson production in, 11: 5476(J)

color center induced in fused silica by, 11: 5068(J)

compound elastic scattering, 11: 3189(J)

decomposition of HCOOH–O_2 solutions by, 11: 11564(R)

densities, measurement of ratio of thermal to resonance, 11: 8111(J)

detection, design of BF_3-filled ionization chamber for, 11: 7265

detection and measurement, 11: 256(J), 1980, 2548, 11821, 14020(R)

detection and measurement, calibration of equipment, 11: 9765

detection and measurement, calibration of In foil detectors for, 11: 2605

detection and measurement, chamber design for neutron absorption analysis, 11: 10811(R)

detection and measurement, development of B-loaded liquid scintillators, 11: 550(R)

detection and measurement, development of BF_3 tubes for, 11: 7400(R)

detection and measurement, ionization chamber for, 11: 11533(P)

detection and measurement, performance of fission detectors, 11: 3478

detection and measurement, performance of ionization chambers, 11: 3479(R), 4571

detection and measurement, proton-recoil scintillation design for, 11: 2609

detection and measurement and flux distribution plots, techniques for, 11: 5968(J)

detection and measurement by mechanical selection, 11: 13388

detection and measurement in JEEP using nuclear emulsions, 11: 11414

detection and measurement in presence of gamma rays, device for, 11: 11532(P)

detection and measurement in reactors, 11: 5460(J)

detection and measurement in reactors, design of instrument for, 11: 2606, 9574(P)

detection and measurement of intermediate energy, glass scintillators for, 11: 12151(J)

detection and measurement with scintillation detectors, 11: 8735(R)

detection and measurement with thermopiles, 11: 4933(R)

detection of, with β particles in indium foils, 11: 3946

detection of reactor, with β decays and nuclear emulsions, 11: 2974

detection using two organic scintillating solutions, 11: 1602(J)

detection using Szilard-Chalmers reaction, 11: 4572(J)

detection with scintillation counters, 11: 6482(J)

Neutrons (cont'd)

detector studies at Argonne, 11: 6824(J)

detectors for, development, 11: 6863(R)

from deuteron bombardment of B target, angular distribution, 11: 11449(J)

differential elastic scattering of 14-Mev, in Pb, Hg, and Zn, 11: 1642

diffraction scattering at high energies, 11: 2078(J)

diffusion, limiting conditions at the rim of air holes, 11: 12841(J)

diffusion, matrix method in, 11: 12840

diffusion, Serber-Wilson method applied to calculations, 11: 13854

diffusion, thermal and resonance utilization calculation methods for slab geometry, 11: 13827

diffusion and absorption by various types of graphite, 11: 10315(J)

diffusion equation, absorption, scattering, and decay processes, 11: 4611(J)

diffusion equations in x-y geometry for heterogeneous reactor, 11: 2123

diffusion in a single medium, theory approximation, 11: 1267

diffusion in Be, graphite, and H_2O studied by impulse method, 11: 682(J)

diffusion in cylindrical geometry, 11: 2616

diffusion in finite media, statistical distribution of chord lengths applied to, 11: 8543(R)

diffusion in graphite, 11: 8671

diffusion in hydrogen, mathematical analysis, 11: 14025

diffusion in MTA targets, cavities, structures, 11: 14020(R)

diffusion in slab lattices, variational method and associated approximate methods for treating, 11: 13937

diffusion in D_2O, 11: 9769, 11740(R)

diffusion lengths, 11: 13965

diffusion lengths in heterogeneous cylindrical assemblies, 11: 12594

diffusion lengths in H_2O at 77, 374, and 530°F, 11: 3005

diffusion of fission, through uranium at energies above 1 Mev fission of, 11: 10228

diffusion problems, 11: 1656

diffusion solutions by space simulators, 11: 2593

diffusion theories two- and three-group, 11: 4074

diffusion theory, unsymmetric operator in, 11: 4609(J)

diffusion theory, validity in regions where cross sections are space dependent, 11: 4956(J)

diffusion theory boundary condition, 11: 10912

distribution in Pb, 11: 1652(J)

dosage determinations, 11: 1608(J), 4781(R), 5163(J), 8790(R), 11864(J)

dosage of, design and performance of chemical detectors for determining, 11: 12517(R)

dose rates from Po–Be sources measurement of, 11: 482

dosimetry, calibration of chemical radiation detectors, 11: 9576(R)

dosimetry, equipment, 11: 520(J)

dosimetry, list of standards for, 11: 3505

dosimetry, performance of foil detectors, 11: 7920(R)

dosimetry, resonance-threshold foils for, 11: 4569

effectiveness as a function of energy in natural U envelope of Zephyr, 11: 9465

effects of exposure to, on life-span of offspring of male irradiated mice, 11: 6205

effects on carrier storage in diodes of the silicon junction type, 11: 7365(J)

Neutrons (cont'd)

effects on gastrointestinal function in rats, 11: 865(J)

effects on performance of semiconductor devices, 11: 12723

effects on susceptibility to transplanted leukemia in mice, 11: 867(J)

elastic scattering by deuterons at 2.45 and 3.27 Mev, 11: 6143(J)

elastic scattering by 580-Mev protons, 11: 5663(J)

elastic scattering of 590-Mev, by neutrons, 11: 12842(J)

elastic scattering of 136-Mev, by nuclei, 11: 2174(J)

elastic scattering of 3.3-Mev, from Cu, Ta, Pb, and W, 11: 3593(J)

emission from U and Pb when bombarded with 147-Mev protons, 11: 4706

energies calculated for $Be^9(d,n)B^{10}$ for deuterons up to 2 Mev, 11: 5040

energy distribution, computer code for, 11: 1269

energy distribution, from $B^{10}(d,n)C^{11}$ reactions, 11: 2153(J)

energy distribution in infinite medium, code for IBM-650 including inclusion of inelastic scattering, resonance capture and fast fission, 11: 1270

energy levels of nuclear, low and medium, 11: 11366(J)

energy measurements with double pulse scintillation counters, 11: 4593(J)

energy spectrum of Po–Be, measurement, 11: 3028

escape probabilities for singly- and multi-scattered, for a slab, 11: 9045

evaporation, produced by cosmic-ray interactions in various nuclei, 11: 687(J)

fate in finite multiplying medium, conservation, 11: 2142(J)

first-collision probability in hollow cylinders, mathematical analysis, 11: 541

flux calculated in high pressure cell, 11: 13112

flux densities in reflectors, 11: 12185(J)

flux density measurements by In-foil counter, 11: 497(J)

flux distributions in localized absorbers, 11: 8563

flux measurement, intermediate energy, 11: 2979

flux measurement techniques, 11: 590(J), 6532

flux measurements, application to radiation damage studies, 11: 4607

flux measurements in multiplying lattice using europium oxide foils, 11: 13173

flux measurements over energy range of 0.3 to 3.0 Mev, 11: 13428(J)

flux-spectra from foil activations, 11: 9000

gamma-ray yields from resonant capture of slow, 11: 4987(J)

group theory, absorption area method applied to diffusion problems, 11: 12238

ground scattering from a cylindrical symmetric source, 11: 2749

half life, cloud chamber for measuring, 11: 9399

half-life measurements with diffusion cloud chamber, 11: 2026(R)

incoherent scattering by polycrystals, 11: 5059(J)

inelastic cross sections for fission-spectrum, 11: 4009(J)

inelastic scattering, 11: 682(J)

inelastic scattering, direct interaction in, 11: 3197(J)

inelastic scattering, excitation functions, 11: 5660(J)

inelastic scattering by deformed nuclei, theory, 11: 7352(J)

inelastic scattering by paramagnetic media, 11: 4610(J)

inelastic scattering of fission, in U, 11: 6009(J)

inelastic scattering of 2.6 Mev, from Fe^{54}, Fe^{56}, Fe^{57}, W^{182} and W^{184}, 11: 10772

Neutrons (cont'd)

interaction effect on criticality, 11: 9073(J)

interactions (electrons), 11: 13482(J)

interactions between separated containers of fissionable material, theory, 11: 13853

interactions with electrons in liquid Bi, 11: 7292(R)

interactions with nuclei at 1.0, 1.77, 2.5, 3.25, and 7.0 Mev, 11: 3035(J)

ion chamber detectors for, design and performance, 11: 2611

ionization-chamber method of measuring, in mixed γ-n fields of known energy, 11: 3489(J)

kinetic equation of, approximation of Green's function in, 11: 6006(J)

leakage past a step in an annulus, 11: 13217

lethal effects in mice, 11: 864(J)

logarithmic energy width for resonance, in U lattices, 11: 1339(J)

macroscopic scattering, approximation method, 11: 6008(J)

magnetic moment, 11: 1271(J)

magnetic moment, effect of cut-off limit of meson momentum on, 11: 1386(J)

mean free paths in graphite and heavy water, 11: 542(J)

measurement using In^{115} foils and 2π proportional flow counter, 11: 5452(J)

migration area of Po–Be, in H_2O, 11: 14020(R)

motion in potential with complex component, 11: 2024(J)

multiple interactions in resonant foils, 11: 3508(J)

multiplication, notes on calculation of, 11: 11730

nonescape probability for convex bodies, 11: 6861(J)

nuclear capture of polarized, circular polarization of γ radiation following, 11: 5044(J)

nuclear reactions, complex square model for, parameters of, 11: 7712

nuclear reactions, effect on gas formation, 11: 3577

nuclear reactions (n,p) in Mg, Al, Fe, Ni, Cu, Nb, Mo, Rh, Pd, and In, 11: 8190

one-dimensional multiplication and principle of invariant imbedding, 11: 9050(J)

paramagnetic scattering, 11: 551, 1273(R)

pathological effects on laboratory animal, 11: 2779(R)

penetration in carbons and hydrocarbons by fission spectrum, 11: 1268

penetration through non-hydrogenous thick shield, 11: 8750

physics of, developments in, 11: 3880(J)

pion production in photographic emulsion nuclei by 400-Mev, 11: 3998(J)

polarization in $p + n \rightarrow d + \pi$ reactions, 11: 10759(J)

polarization of, from D(γ,n) reaction, 11: 5492(J)

polarization of, from (d,d) reactions, 11: 4117(J), 6491

polarization of, produced in (p,n) reactions, 11: 3015(J)

polarization of, scattered by C, 11: 4736(J)

polarization of, scattered by lead, 11: 5491(J)

polarization of 1- to 18-Mev, helium analyzer for measurement, 11: 6490

post-irradiation creatinuria in rats exposed to, 11: 11874(J)

production at low voltages, 11: 9888(R)

production by cosmic radiation in lead, 11: 9415(J)

production by electron bombardment of U, 11: 3093(J)

production by μ mesons stopped in Na and Mg, 11: 6114(J)

production from targets bombarded by deuterons, 11: 9778

production in Be exposed to neutron irradiation 11: 3510

Neutrons (cont'd)

production in deuteron stripping from He^3, 11: 9773

production in Pb by penetrating μ mesons at sea level, 11: 3890

production in MTA, 11: 13197(R)

production of intense cold beams, 11: 10230(J)

properties of, book, 11: 12193(J)

protection from, 11: 1712(P)

proton elastic scattering at 315-Mev, polarization in, 11: 4153(J)

proton scattering, saturation of nuclear forces, 11: 13546(J)

proton scattering by, analysis of polarization, 11: 6951(J)

in pulse discharge in deuterium, 11: 432(J)

radiation effects on metals, 11: 361(J)

radioactivity induced in food by exposure to, 11: 5733

reactions with medium weight nuclei at 14 Mev, protons from, 11: 5626(J)

reactions with protons, differential cross sections for bremsstrahlung during, 11: 4201(J)

relation to nuclear structure, 11: 3096(J)

resonance absorption, effects of geometry, 11: 1618(R)

resonance absorption by U cylinders, 11: 4769(J)

resonance absorption curves, method for estimating area under, 11: 4011

resonance absorption in heterogeneous matrices, 11: 9805

resonance absorption in homogeneous mixtures, effect of Doppler broadening on, 11: 4008

resonance absorption in metal and oxide cylinders, 11: 10335(J)

resonance absorption theory, 11: 11348

resonance capture by Th cylinders, 11: 7715

resonance capture in pitchblendes, 11: 3407(J)

resonance capture integrals, 11: 682(J)

resonance data, relation to nuclear structure, 11: 6033(J)

resonance data for slow, analysis, 11: 6857(J)

resonance escape probability in slab lattices, 11: 6007(J)

resonances and cross sections for various elements, 11: 8541(R)

scattering, analysis of s-wave, 11: 6863(R)

scattering, angular distributions, 11: 13459(J)

scattering, approximation method for macroscopic, 11: 6008(J)

scattering, compound elastic, 11: 3189(J)

scattering, direct interaction in inelastic, 11: 3197(J)

scattering, effect of modulated spherical waves, 11: 2024(J)

scattering, energy distribution of, 11: 2160

scattering, estimate of the imaginary part of the complex potential, 11: 7289(J)

scattering, excitation functions for inelastic, 11: 5660(J)

scattering, optical model theory, 11: 3196(J)

scattering, spheroidal complex potential calculations, 11: 6144(J)

scattering, theory and experiments, 11: 3592

scattering, theory of multiple, 11: 13535(J)

scattering by air, energy and angular distribution, 11: 1618(R)

scattering by air, Monte Carlo calculation, 11: 7286

scattering by alpha, particles contribution of tensor forces to, 11: 4733(J)

scattering by Al, 11: 8153(J)

scattering by deformed nuclei, theory, 11: 7352(J)

Neutrons (cont'd)
scattering by gases, angular averages in, 11: 4729(J)
scattering by graphite, density effect, 11: 1275(R)
scattering by lattice vibrations of V, 11: 755(J)
scattering by Ne, 11: 8146(J)
scattering by para- and ortho-hydrogen, 11: 547(J)
scattering by protons, 11: 4728(J)
scattering by protons, analysis of polarization in, 11: 6951(J)
scattering by protons, at 90 Mev, 11: 6955(J)
scattering by protons, photographic plate study, 11: 4728(J)
scattering by protons, theory, 11: 9081(J)
scattering by protons and neutrons, 11: 3003(J)
scattering by protons at 95 Mev, polarization in, 11: 10341(J)
scattering by protons in presence of noncentral forces, 11: 4150(J)
scattering by spin waves in magnetite, 11: 9433(J)
scattering by U, 11: 816(J)
scattering calculations on UNIVAC, coding for, 11: 4543
scattering lengths of, on deuterons, 11: 5665(J)
scattering of, angular distributions, 11: 591(J)
scattering of 4.4-Mev, by Al, Ca, Cr, and Bi, 11: 2022(J)
scattering of 14-Mev, 11: 9054(R)
scattering of 4.4-Mev by Fe, C, and Zn, 11: 6856
scattering of low energy, by spheroidal complex potential, 11: 6144(J)
scattering of 130-Mev, by protons, differential cross section measured for, 11: 2175(J)
scattering of polarized, by C^{12}, 11: 1682(J)
scattering of slow, by H_2O molecules, 11: 546(J)
scattering of slow, in hydrogeneous materials, 11: 1265, 5666(J)
scattering of slow, theory, 11: 6953(J)
scattering of 2.61- to 4.09-Mev, on He^4, 11: 6038(J)
scattering theorem applied to finite tamper, 11: 12181
scattering theory, 11: 550(R), 3592, 6489, 6944, 7289(J), 11739(R)
scattering theory of neutron-proton, in presence of noncentral forces, 11: 4150(J)
slowing down and diffusion constants in BeO, temperature dependence, 11: 9436(J)
slowing down and spatial distribution in an infinite multiplying medium, 11: 1337(J)
slowing down area in bismuth–graphite lattices, 11: 4608
slowing down by U–H_2O media, 11: 545(J)
slowing down density in bounded media, 11: 9767
slowing down distribution in mixtures of up to eight elements, Monte Carlo calculation, 11: 4006
slowing down in hydrogenous medium, theory, 11: 6557
slowing down in infinite homogeneous medium, 11: 9766
slowing down in H_2O from 1.46 to 0.025 ev, 11: 544(J)
slowing-down length in ordinary water using a pulsed source, 11: 7290(J)
slowing down of fission, in H_2O, 11: 543(J), 9189(R)
slowing down time and diffusion constants in BeO, 11: 9435(J)
slowing-down time distribution in hydrogen, Monte Carlo calculation, 11: 13425(J)
slowing-down time distribution in water, experimental measurement, 11: 13426(J)
spatial distribution of, from reactor shield ducts, 11: 5056
Neutrons (cont'd)
statistical theory of multiplicative chains, 11: 2618
streaming in cylindrical cavities, mathematical analysis, 11: 9885
streaming through Fe, effect of impurities on, 11: 13884(R)
temperature measurements on, in graphite, 11: 5802(J)
thermal inelastic scattering in polycrystalline graphite, 11: 6862(J)
thermalization by heavy crystalline moderator, 11: 6860(J)
thermalization of, theory, 11: 682(J), 8174
time-of-flight 1024-channel analyzer for, 11: 1597(J)
time-of-flight techniques in 100-Mev region, 11: 3003(J)
transmission measurements, drying of powders for, 11: 5329
transmission of collimated beam and of monoergic, 11: 1266
transmission of fission, by straight cylindrical ducts in water, 11: 5490
transmission through holes in H_2O shields, 11: 13885(R)
transport and diffusion in cylindrical cavities, 11: 13829
transport equation, 11: 7842(R)
transport equations, approximation, 11: 10915
transport equations, numerical solutions for time-dependent, 11: 5430(J)
transport problems in cylindrical geometry, spherical harmonics method, 11: 7287(J)
transport theory, spherical harmonics method, 11: 8992, 10688
transport theory, study of solution for equations of, 11: 2019
two-component theory, and space reflection, 11: 9450(J)
velocity distribution from diffusing media, time-of-flight method, 11: 9434(J)
velocity selector for fast, construction of rotor for, 11: 2026(R)
velocity selectors and mechanical selectors for detection and measurement, 11: 590(J)
velocity spectrum in a heavy moderator, 11: 8110(J)
yield from Ra–Be and Rn–Be sources, review, 11: 11347(J)
yields from thick targets bombarded with 24-Mev deuterons and 12-Mev protons, 11: 4709(J)
yields from 340-Mev proton reactions, 11: 8722
zero-energy scattering by optical models, 11: 3196(J)
Nevada (Clark Co.)
geology of Nevada Proving Grounds Area in, 11: 4871
Nevada (Lincoln Co.)
exploration of Atlanta District in, 11: 4863
uranium occurrence in Panaca Area in, 11: 3403
Nevada (Nye Co.)
geology of Nevada Proving Grounds Area in, 11: 4871
Nevada Proving Grounds
geology, 11: 4871
Nevada (Washoe Co.)
geology and mineralogy of Buckhorn claims in, 11: 3402
New Brunswick Lab., AEC, N. J.
progress reports, 11: 1429(R), 6256(R), 9589(R), 10811(R), 10813(R), 10814(R), 10858(R), 12332(R), 12348(R), 12404(R), 12405(R), 12406(R), 12971(R)
progress reports in chemistry, 11: 9590(R), 13598(R), 13599(R)
progress reports on Th program, 11: 8289(R)
New Hope Claims (Wyo.)
geology, 11: 12734

New Mexico

preliminary geologic map of Laguna 4 NW Quadrangle in Bernalillo, Sandoval, and Valencia Cos. in, 11: 12041(J), 12042(J)

stratigraphy of the Morrison formation in northwestern, 11: 2910(J)

uranium deposits, collected field material on, 11: 6356(R)

New Mexico (Socorro Co.)

airborne radiometric survey in Lemitar–Ladron Area in, 11: 11191

New Mexico. Univ., Albuquerque

progress reports, 11: 3325(R)

New York

environs monitoring for Rn concentration, 11: 6211

New York (Essex Co.)

occurrence of rare-earth-bearing apatite in Mineville District in, 11: 2911(J)

New York Univ., New York

progress reports on fluorescence and conductivity phenomena, 11: 1178(R), 1179(R), 4488(R)

New York Univ., New York. Atomic Energy Commission Computing Facility

progress reports, 11: 479(R)

Newport News Shipbuilding and Dry Dock Co., Va.

progress reports on nuclear merchant ships, 11: 13979(R), 13980

Nichrome
See Nickel alloys.

Nickel

activation determination in Al alloys, 11: 1776

adsorption on Mo, 11: 7976

alpha, p, and d reactions at high energies in, absolute cross sections for production of secondary particles, 11: 4114

angular distribution of elastically scattered 5.7-Mev protons from, 11: 9446(J)

as base metal for oxidation and liquid Na resistant brazing alloys, 11: 275(R)

bremsstrahlung reactions (γ,p) at 17.5 Mev, 11: 7336(J)

burnout data for, in boiling water, 11: 8580

burnout of tubes of, 11: 10063

burnout studies at 1,000 psia and 2,000 psia, 11: 13866(R)

burnout tests for rectangular channel, 11: 8719(R)

chemical reactions with H_2O, effect of H formed and metal lost, 11: 2253

chromatographic adsorption on Al_2O_3 from mixtures of $LiNO_3$–KNO_3, 11: 4377(J)

colorimetric determination by dimethylgloxime method, 11: 10815(R)

colorimetric determination in U, 11: 7429(R)

colorimetric determination in UF_4, 11: 12971(R)

corrosion, 11: 12585(R)

corrosion by BrF_3, BrF_5–BrF_3, and Br_2–BrF_3, 11: 13581(R)

corrosion by fluorine gas at high temperatures, 11: 7184

corrosion by fused salt mixtures, 11: 7407(R), 7408(R), 9581(R)

corrosion by liquid Na, 11: 9285

corrosion by Na and NaK, 11: 2481(R)

corrosion by H_2SO_4 solutions, 11: 4432

corrosion by tropical environments, 11: 10538

corrosion by UO_2SO_4, 11: 7858(R)

corrosion by Versene and $Al(NO_3)_3$ solutions, 11: 8379

Nickel (cont'd)

corrosion following irradiation, 11: 12963(R)

corrosion studies, 11: 7513(R)

creep, effect of ceramic coating on, 11: 5307

crystal structure of electrodeposited, 11: 5222

determination in homogeneous reactor solutions, 11: 4292(J), 10974

diffusibility of H_2 on surface, 11: 7100(J)

diffusion in NiO, 11: 6745(J)

diffusion of Al into Ni bonding layer of Al-sheathed fuel elements, 11: 5879

drawing for EBR breeding blanket blocks, 11: 10921(R)

ductility, 11: 13682(R)

effects on reactivity of homogeneous thermal breeder, 11: 11760

electrodeposition, 11: 9186(R)

electrodeposition on cermets, 11: 10523

electrodeposition on Th, 11: 8492(R), 13783

electrodeposition on U, 11: 8466, 8486

electromagnetic radiation emitted from impact of H^+ ions on surfaces, 11: 3193(J)

emissivity and reflectivity, measurement of total normal, 11: 6421

energy levels from Coulomb excitation, 11: 2090(J)

explosive reactions with H_2O at high temperatures, 11: 2511

fission product decontamination by wash solutions, 11: 13579(R)

fluorescence yield, 11: 4646(J)

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gamma reaction, energy and angular distribution of photoprotons from, 11: 8204(J)

gamma reactions (γ,α), 11: 6549(J)

gamma reactions (γ,n), 11: 704(J)

gamma spectra, 11: 2090(J)

gravimetric determination with dimethylglyoxime, 11: 2281

heat capacity at low temperatures, 11: 1913(J)

heat radiation and emissivity measurements, 11: 3797

heat transfer to water, 11: 1848

high-temperature corrosion by NaOH, 11: 5312

high-temperature oxidation between 750 and 1050°C, 11: 9339(J)

hydrofluorination in fused fluoride melts, 11: 13582(R)

hydrogen diffusion in coated and uncoated, 11: 5307

ion emission from positive Cs ion bombardment, 11: 1945(J)

ion exchange behavior on Dowex-50, 11: 5276(J)

K fluorescence yield, 11: 5545(J)

mining, production, availability and physical metallurgy, review, 11: 349(J)

multi-band electric conductivity, 11: 10109

neutron absorption, 11: 7709(R)

neutron reactions, 11: 10554

neutron reactions (n,γ), 11: 13209

neutron reactions (n,p), energy distribution of protons from, 11: 5623(J)

neutron transmission and scattering cross, 11: 11740(R)

oxidation and adsorption of O_2 on, 11: 11918

permeability to gases, 11: 1959(J)

plastic flow, effect of strain and temperature on, 11: 7204(J)

Nickel (cont'd)

plating on non-magnetic base metals, thickness measurement, 11: 1558

precipitation-separation from Co using $Ni(OH)_3$, 11: 6584(P)

proton elastic scattering by, at 18.7 Mev, 11: 2092(J)

proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)

proton reactions (p,n) and deuteron reactions (d,n), 11: 4718(J)

radiation damage, 11: 1167(J), 1922(R)

radiation effects on resistivity, 11: 8942(R)

reactions with molten NaOH, 11: 358(J), 2818(J)

recrystallization at low temperatures, 11: 11236(J)

reduction by hypophosphite, formation conditions, plating properties, and reaction mechanisms, 11: 7200(J)

rupture discs, effects of gaseous detonation on, 11: 1541

separation from cobalt, 11: 7387(P)

separation from Co by solvent extraction with di(2-ethylhexyl) phosphoric acid, 11: 10036(R)

solid state reactions between, and various reactor poison-bearing compounds, 11: 13881

spallation by 340-Mev protons, 11: 2254(R)

spectrophotometric analysis for B, 11: 4307(J)

spectrophotometric determination, 11: 8296(R)

spectrographic determination in Bi and Bi–U alloys, 11: 4283

static corrosion, 11: 13564(R)

substructure and correlation to tensile property, study of, 11: 1536

tensile properties, effects of solute atoms and temperature on, 11: 6412(J)

tensile properties of rolled green strip, 11: 9749

thermal properties at high temperatures, 11: 1527(R)

volumetric determination in reactor solutions, 11: 11586(R)

wear resistance at 600°F, 11: 5896

welding, 11: 8686(R), 8687(R)

Nickel alloy–aluminum–chromium–nickel alloy couples
See Aluminum–nickel alloy–chromium–nickel alloy couples.

Nickel alloy–chromium–aluminum–nickel alloy couples
See Aluminum–nickel alloy–chromium–nickel alloy couples.

Nickel alloy–copper couples
See Copper–nickel alloy couples.

Nickel alloy–copper–iron couples
See Copper–iron–nickel alloy couples.

Nickel alloys

(See also Nickel steel.)

activation induced during one cycle of MTR highest flux, 11: 2758

brazing to Inconel, 11: 7196(R)

coating with W for carburization studies, 11: 4880(R)

corrosion, 11: 9863(R), 11682(R), 12585(R)

corrosion, radiation induced, 11: 13836(R)

corrosion and mass transfer in fused NaOH, 11: 12456(R)

corrosion and wear, data for water-cooled reactors, 11: 12028

corrosion by anisol–BF_3 system, 11: 6368(R)

corrosion by aqueous reactor fuel solutions, 11: 8449

corrosion by BrF_3, BrF_5–BrF_3, and Br_2–BrF_3, 11: 13581(R)

corrosion by fluorine gas at high temperatures, 11: 7184

corrosion by fused fluoride melts, 11: 9581(R)

Nickel alloys (cont'd)

corrosion by high purity water, 11: 2903(J), 2904(J), 12035(J)

corrosion by liquid Rb, 11: 8531

corrosion by Thorex solutions, 11: 7487

corrosion by UF_4, 11: 9690

corrosion by UCl_3–H_2O, HCl, UCl_3–HNO_3, and H_2SO_4, 11: 12965(R)

corrosion by UO_2SO_4, 11: 7859(R), 9869(R)

corrosion by Versene and $Al(NO_3)_3$ solutions, 11: 8379

corrosion of Hastelloy A and B by HNO_3–UCl_3 and H_2O–UCl_3, 11: 11053(R)

corrosion of Hastelloy-F by boiling aqua regia, 11: 12321(R)

corrosion of Inconel by boiling 70% HNO_3, 11: 12321(R)

corrosion of Inconel in decontaminating solutions, 11: 8708(R)

corrosion of stressed and unstressed springs of Inconel-x, Haynes 25, and Allegheny A286 by water, 11: 10080

creep and relaxation tests, correlation, 11: 310

creep and rupture stresses at high temperatures for jet applications, 11: 307

creep data, rate equation for extrapolation of, 11: 12741

ductile matrix, effect of TiC_2 reinforcing on creep and slip, 11: 301

fission product decontamination by wash solutions, 11: 13579(R)

hardness at elevated temperatures, effects of Cr, W, Mo, T, Co, and Al on, 11: 3861(J)

heat radiation and emissivity measurements, 11: 3797

heat transfer and burnout to water at high subcritical pressures, 11: 5834

heat transfer rates of tubes, 11: 11161

high-temperature, review, 11: 385(J)

high-temperature corrosion by NaF–UF_4 and LiF–UF_4 systems, 11: 13762

high-temperature corrosion by NaOH, 11: 5312

high-temperature creep-rupture properties, 11: 323

high-temperature properties in relation to design, relaxation, and stress, 11: 6367

intergranular oxidation, effects of temperature and stress on, 11: 2901

mass transfer by Li at high temperatures, 11: 4464(R)

mechanical and corrosion properties of Inconel X, 11: 12058

mechanical properties, radiation effects on, 11: 10353(R)

mechanical properties of aircraft structural, data, 11: 1051

melting and casting atmospheres, effects on cast, 11: 366(J)

molten, chemical reactions, 11: 12968

neutron reactions (n,γ), 11: 13209

phase diagrams of gamma and eta phases, 11: 1166(J)

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

production, welding, fabrication, high-temperature properties, and applications, review, 11: 349(J)

properties for high-temperature applications, 11: 6399(J)

radiation effects, 11: 8747(R), 13724

radiation effects on hardness, 11: 13868(R)

radiation effects on tensile properties, 11: 2493

recrystallization and aging, temperature effects and phase studies, 11: 1156(J)

rupture strength of Inconel X and 700, Incoloy 901, Refractoloy, and R-235 sheet at 1200 and 1350°F, 11: 5885

Nickel alloys (cont'd)

solid-phase bonding, development of, 11: 1882(R)

specific heat and thermal expansion of Hastelloy B and C, 11: 6382(R)

temperature distribution and thermal stresses, 11: 13046

temperature effects on deformation, recrystallization, and aging of Inconels, 11: 1156(J)

tensile and elastic properties at temperatures to 1200°F and at various loading rates, 11: 3851(R)

tensile properties, effect of NH_3, water vapor, and S additions on, 11: 13779(R)

tensile properties, effects of temperature, 11: 8544

thermal capacity, 11: 4817

thermal expansion in temperature range 20 to 1,000°C, 11: 4478(J)

weld cracking susceptibility test, 11: 376(J)

Nickel–aluminum alloys
See Aluminum–nickel alloys.

Nickel–aluminum–chromium–titanium alloys
See Aluminum–chromium–nickel–titanium alloys.

Nickel–aluminum oxide systems
See Aluminum oxide–nickel systems.

Nickel–aluminum–titanium alloys
See Aluminum–nickel–titanium alloys.

Nickel–beryllium alloys
See Beryllium–nickel alloys.

Nickel–boron–chromium–iron systems
See Boron–chromium–iron–nickel systems.

Nickel–boron–chromium systems
See Boron–chromium–nickel systems.

Nickel–calcium alloys
See Calcium–nickel alloys.

Nickel carbonates

fractionation and size distribution analysis, 11: 7402

Nickel–chromium alloys
See Chromium–nickel alloys.

Nickel–chromium coatings
See Chromium–nickel coatings.

Nickel–chromium–cobalt alloys
See Chromium–cobalt– nickel alloys.

Nickel–chromium–cobalt–iron alloys
See Chromium–cobalt–iron–nickel alloys.

Nickel–chromium–europium oxide–iron systems
See Chromium–europium oxide–iron–nickel systems.

Nickel–chromium–iron coatings
See Chromium–iron–nickel coatings.

Nickel–chromium–iron–molybdenum alloys
See Chromium–iron–molybdenum–nickel alloys.

Nickel–chromium–molybdenum alloys
See Chromium–molybdenum–nickel alloys.

Nickel–chromium–molybdenum steel
See Chromium–molybdenum–nickel steel.

Nickel–chromium steel
See Chromium–nickel steel.

Nickel–chromium–titanium alloys
See Chromium–nickel–titanium alloys.

Nickel coatings

(See also Slug coatings (Ni); Uranium (Ni clad).)

diffusion heat-treated, corrosion resistance to water, 11: 8485(R)

Nickel coatings (cont'd)

on graphite, liquid Na corrosion resistant, 11: 11573(R)

heat and corrosion-resistant, testing for steel, 11: 3385(R)

hydrogen adsorption on, condensed in high vacuum, 11: 11991(J)

nondestructive measurement of the thickness of, on U, 11: 8465

on non-magnetic base metals, thickness measurement, 11: 1558

preparation by electrophoretic deposition, 11: 8514(R)

for uranium, deposition, 11: 7656(R), 7657(R)

Nickel–cobalt alloys
See Cobalt–nickel alloys.

Nickel–cobalt–iron alloys
See Cobalt–iron–nickel alloys.

Nickel complexes

with halides, stability in aqueous solutions, 11: 146(J)

with nitrosonaphthol, formation constants, 11: 4301(J)

phthalocyanine-, polymerization, 11: 106

Nickel compounds

formation and high-temperature properties of NiO·BeO, 11: 4428(J)

Nickel–copper alloys
See Copper–nickel alloys.

Nickel–copper–silicon systems
See Copper–nickel–silicon systems.

Nickel films

electron scattering by, at 20 kev, 11: 440(J)

magnetic domain patterns on thin, 11: 7203(J)

Nickel fluorides

solubility in $NaF–ZrF_4$, 11: 13652(R)

Nickel hydroxides

for precipitation-separation of Ni and Co, 11: 6584(P)

Nickel ions

oxidation by Br_2, 11: 106

Nickel–iron alloys
See Iron–nickel alloys.

Nickel–iron alloys (liquid)
See Iron–nickel alloys (liquid).

Nickel–iron–molybdenum alloys
See Iron–molybdenum–nickel alloys.

Nickel–iron–oxygen systems
See Iron–nickel–oxygen systems.

Nickel–iron–titanium alloys
See Iron–nickel–titanium alloys.

Nickel isotopes

charge distribution by electron scattering from Ni^{58} and Ni^{60}, 11: 2159

formation during irradiation of stainless steel, 11: 10554

neutron inelastic scattering, 11: 3592

neutron total cross sections, 11: 10229

thermal neutron reactions (n,γ), 11: 710(J)

Nickel isotopes Ni^{57}

decay properties, 11: 3057(J)

Nickel isotopes Ni^{58}

energy levels, 11: 12186(R)

energy levels from proton scattering data, 11: 9186(R)

neutron reactions at 14 Mev, energies of protons from, 11: 5626(J)

neutron reactions (n,p), cross sections for, 11: 8677(R)

Nickel isotopes Ni^{58} (cont'd)

neutron resonances in kev region, 11: 6065(J)

neutron transmission, 11: 8562(R)

proton scattering and compound states of system $Ni^{58} + p$, 11: 3053(J)

Nickel isotopes Ni^{59}

energy levels, 11: 4710(J), 10323(J)

energy levels, neutron threshold technique, 11: 1277(R)

Nickel isotopes Ni^{60}

energy levels, 11: 12186(R)

energy levels from proton scattering data, 11: 9186(R)

excited states, parity, 11: 4059(J)

neutron reactions at 14 Mev, energies of protons from, 11: 5626(J)

neutron resonances in kev region, 11: 6065(J)

Nickel isotopes Ni^{62}

neutron cross sections, 11: 1640(J)

Nickel isotopes Ni^{63}

formation and β spectra, 11: 10623

half life, 11: 1640(J)

preparation by $Cu^{63}(n,p)$ reaction and β spectrum, 11: 11307(J)

Nickel isotopes Ni^{64}

neutron activation cross section, 11: 13868(R)

Nickel isotopes Ni^{65}

decay schemes, 11: 550(R)

gamma cascades in decay of, directional correlation measurements, 11: 3061(J)

Nickel–magnesium oxide systems
See Magnesium oxide–nickel systems.

Nickel–molybdenum alloys
See Molybdenum–nickel alloys.

Nickel oxide films

reduction by atomic H, 11: 7936(J)

Nickel oxides

electrophoretic deposition, use of zein in, 11: 11572(R)

neutron activation analyses for Al, Mg, and Ti, 11: 8296(R)

permeation of Ni into, 11: 6745(J)

standard free energy of formation, 11: 6236

Nickel–palladium alloys

electrical resistivity, 11: 7202(J)

Nickel–plutonium alloys

properties as shim rods in fast reactors, 11: 13094

Nickel–polonium alloys

preparation and crystal structure, 11: 3413

Nickel powders

annealing of deformed, investigated by x-ray and stored energy measurements, 11: 4892(J)

rolling, 11: 9749

Nickel–silver alloys (liquid)

enthalpy of formation, determination, 11: 3427(R)

Nickel–sodium hydroxide systems

reactions in vacuum at temperatures to 1000°C, 11: 2818(J)

Nickel steel

(See also Chromium–nickel steel.)

Nickel steel (cont'd)

neutron irradiation effects, 11: 4739

stress-corrosion tests of, in high-temperature water, 11: 1865

Nickel sulfate–uranyl sulfate–water systems

phase studies, 11: 9587(R)

Nickel sulfides

oxidation at elevated temperatures, 11: 1766(J)

Nickel–thorium alloys

preparation of eutectic, by bomb reduction, 11: 7673(R)

Nickel–titanium alloys

phase studies, 11: 4468

solubility of Ti in Ni γ-hard solution at 800°C, 11: 354(J)

substructure and correlation to tensile properties, 11: 1536

Nickel–titanium boride systems

properties of high alloy, 11: 6347

Nickel–titanium carbide compacts

preparation by low-frequency vibratory method, 11: 11181

Nickel–titanium–uranium alloys

physical properties, 11: 3412(R)

Nickel–tungsten alloys

diffusion, structural effects, 11: 3434(J)

Nickel–uranium alloys

fabrication of spherical particles, 11: 7689, 13785

properties of interest for use as refractory fuels, 11: 812

Nickel–zirconium alloys

corrosion tests at elevated temperatures, 11: 1870

oxidation of powdered, kinetics, 11: 3806

Nicotine

occurrence of lysine in pyridine ring, 11: 3323(J)

Niobates

dielectric permeability of divalent metal, 11: 264(J), 10076(J)

ferroelectric properties, theory, applications, 11: 6750(J)

Niobium

alpha-particle scattering at 40.2 Mev, 11: 6952(J)

analytical chemistry, bibliography on, 11: 7109

anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)

colorimetric determination in ore, after separation from Ta and Ti, 11: 1833(J)

contamination and oxidation, effects of alloying elements on, 11: 6366

coprecipitation with $BiPO_4$, 11: 8363(R)

corrosion, 11: 11682(R)

corrosion by liquid Cr–U alloy, 11: 7673(R)

corrosion by liquid Th–Mg alloys, 11: 11703(R)

corrosion by water, 11: 8911, 12898(R)

creep, ductility, fatigue, purification, weldability, and oxidation in the range 350 to 525° C, 11: 3831(R)

decontamination by solvent extraction, 11: 13579(R)

determination in mixture of Nb_2O_5 and Ta_2O_5 using radioactive tracer, 11: 5778

determination in presence of large quantities of Ti, 11: 10447(J)

determination in Thorex Process streams, 11: 3697

Niobium (cont'd)
determination of O_2, H_2, and N_2 in, 11: 10445(J)
etch pits and sub-boundaries in, 11: 8927(J)
extraction, 11: 7385(P)
gamma rays from neutron inelastic scattering, 11: 3592
gravimetric determination in Nb–U alloys, 11: 926
high-temperature corrosion by $NaF-UF_4$ and $LiF-UF_4$ systems, 11: 13762
high-temperature oxidation and contamination, 11: 5760
ion exchange separation from HCl, and HCl–HF, 11: 8282(R)
K fluorescence yield, 11: 5545(J)
melting point, hardness, and gas content, 11: 6407(J)
neutron cross sections, multigroup, 11: 12284
neutron reactions (n,γ), 11: 13209
neutron scattering data, 11: 10229
neutron total cross sections and resonances in kev region, 11: 4047(J)
oxidation at elevated temperatures, 11: 12456(R), 12473(R)
physical and mechanical properties, effects of alloying elements on, 11: 6408(J)
polygraphic behavior and determination of, in H_2SO_4, 11: 12678(J)
powder metallurgy, 11: 5333
preparation by reduction of Nb_2O_5, 11: 7673(R), 11702(R), 11703(R), 11704(R), 12047
production, properties, occurrence, and corrosion, 11: 6406(J)
production by melting, powder metallurgy techniques, and fabrication, 11: 6410(J)
properties, 11: 12063(J)
purification by sintering, 11: 6409(J)
radiochemical determination in HRT fuel solution, 11: 12343
recovery from aqueous raffinate from irradiated-U processing, 11: 11506(P)
recovery from Redox waste, 11: 7430(R)
refining, coating, corrosion, and alloys, 11: 348(J)
removal from Redox feed solutions by Super Filtrol scavenging, 11: 8373
separation from ore concentrates by caustic fusion, 11: 10471
separation from tantalum, 11: 7386(P), 11942(J)
separation from Ta, a literature survey, 11: 1811
separation from Ta, Mo and W, 11: 3703
separation from Ta, Ti, Sn, and Sb by means of 8-quinolinol, 11: 13294(J)
separation from Ta by HF or NaOH, 11: 4454(R)
separation from Ta by solvent extraction, 11: 181, 3229(P), 5259, 7673(R), 7676(R), 11501(P), 11703(R), 11704(R)
separation of Ta from, by precipitation with N-benzoyl-N-phenyl-hydroxylamine, 11: 7951(J)
separation from Ti by precipitation, fusion, and solvent extraction, 11: 7673(R)
separation from Ti by solvent extraction, 11: 7677(R), 11704(R)
sintering, removal of gaseous impurities by, 11: 6409(J)
solubility in $HF-H_2O_2$, 11: 1917(J)
solubility in molten Zr, 11: 7677(R)
solvent extraction, 11: 7969, 13197(R)
solvent extraction from HNO_3 solutions with TBP, effects of H_3PO_4 on, 11: 13666
solvent extraction of rhodanide complexes of, using Nb^{95}, 11: 10483(J)
solvent partition, distribution ratios, 11: 12186(R)
sorption on Dowex-1 and elution with HCl–HF solutions, 11: 12339(R)
spectrophotometric determination in Nb–U alloys, 11: 8842(J)
x-ray-fluorescence determination in Nb oxide, 11: 4824

Niobium alloys
compilation of data on, 11: 309
corrosion by H_2SO_4, 11: 3809(R)
corrosion by water at 300°C, 11: 10078, 11688(R)
diffusion rates of O_2 in, 11: 6366
hardness at room temperature and 1600°F and oxidation resistance at 1800°F as affected by titanium additions, 11: 4874
mechanical properties, corrosion, and constitution diagrams, 11: 6406(J)
oxidation at elevated temperatures, 11: 12473(R)
oxidation rates, 11: 13782(R)
oxidation-resistant, 11: 13779(R)

Niobium–aluminum–zirconium alloys
See Aluminum–niobium–zirconium alloys.

Niobium–beryllium oxide systems
See Beryllium oxide–niobium systems.

Niobium borides
heat of formation, 11: 8909(J)

Niobium carbides
chemical, physical, and mechanical properties, 11: 5856

Niobium chloride–tantalum chloride systems
liquid-vapor equilibrium of $NbCl_5-TaCl_5$, 11: 6243(J)

Niobium chlorides
boiling point and heat of vaporization of $NbCl_5$, 11: 6243(J)
crystallographic data for $NbCl_5$, 11: 3714(J)
saturation pressure of $NbCl_4$, 11: 913
vapor deposition on U, 11: 13776

Niobium complexes
with chloride, anion exchange, 11: 2254(R)
with nitrosonaphthol, formation constants, 11: 4301(J)

Niobium compounds
compilation of data on, 11: 309
molecular structure of alkoxides, 11: 1472

Niobium fluorides
thermodynamic properties, 11: 3721(R)

Niobium hydrides
lattice constants and phase studies, 11: 5333

Niobium isotopes Nb^{93}
decay schemes, 11: 7455(R), 9579(R)
energy levels from neutron inelastic scattering, 11: 10705(J)
neutron capture cross sections, problems in measuring, 11: 2058

Niobium isotopes Nb^{95}
energy levels, 11: 8283(R)
high-temperature separation from Zr^{95}, 11: 5252
poisoning effects in thermal homogeneous reactor core, 11: 8601

Niobium isotopes Nb^{97}

decay schemes, 11: 774(J), 3610(J), 5070(J)

Niobium–molybdenum alloys
See Molybdenum–niobium alloys.

Niobium–molybdenum–uranium alloys
See Molybdenum–niobium–uranium alloys.

Niobium ores

acid leaching, 11: 11701(R)

acid leaching for Nb and Ta recovery, 11: 4454(R)

caustic fusion for Nb separation, 11: 10471

processing, 11: 7673(R)

processing of, with basic fusion, 11: 8512(R), 11704(R)

Niobium oxide–uranium oxide systems

sintering, 11: 12000(R)

Niobium oxides

for concentration of Pu by carrier precipitation, 11: 5091(P)

lattice dimensions and density of Nb_2O_5, 11: 8543(R)

polymorphism of Nb_2O_5, 11: 6641(J)

reduction for preparation of Nb, 11: 12047

reduction with Ca and Al, 11: 11704(R)

reduction with C or Ca, 11: 11703(R)

x-ray-fluorescence analysis for Nb, 11: 4824

Niobium–platinum–uranium alloys

metallurgy in fuel rod fabrication, 11: 11717

Niobium steel

corrosion by acid and fluoride solutions, 11: 2480

corrosion by Cl^-, F^-, Ce^{4+}, $Cr_2O_7^{2-}$, SO_2, and HNO_3, 11: 12484

specifications, 11: 12484

Niobium–thorium alloys

phase studies, 11: 11703(R)

Niobium–thorium oxide systems

physical and mechanical properties, 11: 6713

Niobium–tin–uranium–zirconium alloys

high-temperature reactions with steam, 11: 10499

Niobium–tin–zirconium alloys

corrosion by UO_2SO_4, 11: 10533

Niobium–titanium alloys

crystal structure modification by addition of B, Mo, V, Zr, Bi, and Te, 11: 8016(J)

Niobium–uranium alloys

aging characteristics and phase studies, 11: 13794(R)

bonding to U, 11: 7673(R)

cladding with U, 11: 11703(R)

cladding with Zircaloy II, 11: 7626(R)

coating, development of barrier coat materials, 11: 8463

compression properties, corrosion, and analyses, 11: 7663(R)

constitution diagrams, 11: 7677(R)

corrosion, mechanical properties, and constitution diagrams, 11: 11702(R)

corrosion and phase diagrams, 11: 10986(R)

corrosion by boiling water, 11: 7664(R), 7665(R), 8487(R), 12469

corrosion by 500°F water, 11: 13864(R)

corrosion by water, 11: 8720(R), 9286, 10923(R), 13866(R), 13868(R)

corrosion in high-temperature water and hydridation, 11: 10872

Niobium–uranium alloys (cont'd)

corrosion resistance, phase studies, and properties, 11: 11716

corrosion testing, 11: 10876, 10987(R)

creep strength at 1500 to 1800°F, 11: 12630

effects of radiation on corrosion-resistant, 11: 10354(J)

equilibrium diagram and tensile properties, 11: 13771

extrusion, impact, 11: 12478

fabrication and phase studies, 11: 7673(R)

gravimetric analysis for Nb, 11: 926

high-temperature reactions with steam, 11: 10499

mechanical properties, phase studies, melting points, and preparation, 11: 13042

melting, extrusion, rolling, machining, 11: 4889

metallographic determination of phase diagram, 11: 3428

metallurgy in fuel rod fabrication, 11: 11717

microstructure, 11: 12954

phase changes in pile-irradiated, 11: 1711(J)

phase studies, 11: 1121, 7662(R), 7676(R), 8512(R), 8926, 10987(R), 11704(R)

phase studies, radiation effects, corrosion, 11: 13189(R)

phase studies and preparation, 11: 11703(R)

phase transformations, 11: 10987(R)

preparation and heat treatment, 11: 13824

preparation by Ca reduction of the fluorides, 11: 4454(R)

quenched by water at high temperatures, 11: 13818

radiation effects, 11: 10901

radiation effects and casting, 11: 11688(R)

radiation effects on corrosion-resistant, 11: 10354(J)

roll cladding, 11: 7625

spectrophotometric analysis for Nb and U, 11: 8842(J)

tensile properties, 11: 7665(R)

transformation kinetics of the γ solid solution, 11: 1121

Niobium–uranium alloys (clad)

corrosion and mechanical properties, 11: 7625

corrosion by H_2O, 11: 13868(R)

corrosion by high-temperature water, 11: 10872

Niobium–uranium alloys (Zr alloy clad)

corrosion by high temperature H_2O and steam, 11: 13323

fabrication techniques and irradiation in MTR, 11: 11721

testing for in-pile behavior of defected, procedure, 11: 14002

Niobium–uranium–zirconium alloys

casting, heat treatment, melting and equilibrium diagrams, 11: 8462(R)

casting and cladding, 11: 11688(R)

casting and melting, 11: 10887(R)

constitution diagrams, corrosion, heat treatment, hardness, 11: 10887(R), 11702(R), 11774(R)

corrosion, 11: 11744(R)

corrosion, effect of gas removal and heat treatment on, 11: 8462(R)

corrosion and hardness, 11: 11703(R)

corrosion by boiling distilled water, 11: 7629(R), 7664(R)

corrosion by high-temperature water and hydridation, 11: 10872

corrosion by 680°F water and microstructure, 11: 6351

corrosion by water, 11: 8719(R), 9286, 10923, 11808(R), 13866(R)

corrosion by water, effects of heat treatment and composition on, 11: 12458

Niobium–uranium–zirconium alloys (cont'd)
corrosion by water and aging characteristics, 11: 13794(R)
corrosion by water at 500°F, 11: 11745(R)
corrosion by water at 300°C, 11: 11688(R), 13820
corrosion of α-annealed and γ-quenched, by H_2O, 11: 7673(R)
fabrication, 11: 11744(R)
fabrication as core material for EBWR fuel plates, 11: 12873
hardness and microstructure, effects of heat treatment and composition on, 11: 12458
heat treatment, 11: 11744(R)
high-temperature reactions with H_2O, 11: 3834(R)
microstructure and hardness, 11: 7626(R)
phase studies, 11: 7629(R), 8462(R)
production and phase studies, 11: 11689(R)
radiation effects on corrosion-resistant, 11: 10354(J)
thermal stability, 11: 13189(R)
weight change rates, 11: 11698
Niobium–uranium–zirconium alloys (clad)
fabrication, 11: 10887(R)
fabrication and phase studies, 11: 7630(R)
fabrication for EBWR fuel plates, 11: 12873
testing for in-pile behavior of defected, procedure, 11: 14002
Niobium–vanadium alloys
phase studies, 11: 11703(R)
Niobium–zirconium alloys
constitution diagrams, 11: 11704(R)
corrosion by air and UO_2SO_4, 11: 12473(R)
corrosion by UO_2SO_4, 11: 10533
creep and rupture behavior, 11: 1524
hardness-temperature-time curves, with and without Fe and Pd additions, 11: 12898(R)
melting point, composition, and phase studies, 11: 7673(R)
physical properties, 11: 8507(R)
preparation, 11: 13794(R)
resistance-temperature characteristics, 11: 8508(R), 11701(R)
resistance-temperature measurements, 11: 11701(R)
tensile properties and neutron absorption cross sections, 11: 7019(P)
thermodynamic properties, 11: 10563
Nitrate complexes
(See also Ruthenium nitrate complexes.)
with thallium, spectrophotometric study, 11: 4313(J)
Nitrate crystals
(See also Sodium nitrate crystals.)
radiolysis, 11: 7406(R), 11562(R)
Nitrate ions
determination in ETR core, 11: 1276(R)
effect on yeild of H_2 from water radiolysis, 11: 5201(J)
self-diffusion in fused $NaNO_3$ from 315 to 375°C, 11: 11576(R)
solvent extraction from $Ca(NO_3)_2$–$ZrO(NO_3)_2$–HNO_3 solutions with TBP, 11: 3747
Nitrates
(See also specific nitrates.)
calcination and continuous drying of dissolved salts of, use of fluidized beds for, 11: 7940(J)
Nitrates (cont'd)
coloration and luminescence, 11: 5376(J)
radiolysis in concentrated aqueous solutions, 11: 1799
radiolysis of solid, 11: 10026(J)
separation by selective precipitation, 11: 3633(P)
separation from fission products by reduction to NO_2^- with C, 11: 4362
solvent extraction using TBP, 11: 6303(J)
spectrophotometric determination in UO_3, 11: 10812(R)
Nitric acid
activity coefficient, 11: 3333(J)
analysis for nitrite, 11: 12973(R)
analysis in U feed liquors, 11: 12972
corrosive effects, 11: 12585(R)
corrosive effects of boiling 70% on Inconel and sensitized and unsensitized 302 and 304L stainless steel, 11: 12321(R)
corrosive effects on bearing materials, 11: 7616
corrosive effects on carbon graphite bearings, 11: 6343
corrosive effects on Nb steels, 11: 12484
corrosive effects on stainless steel, 11: 3812, 3813, 4430(R), 8357
corrosive effects on stainless steel and Ta, 11: 13027(R)
corrosive effects on Stellite-6, 11: 12898(R)
corrosive effects on Ti and Ti alloys, 11: 7185
corrosive effects on type 347 stainless steel, effect of Cl^-, 11: 12317(R)
corrosive effects on type 316 stainless steel WAPD-30 in-pile loop, 11: 10079
decontamination by distillation, 11: 7593(R)
determination in Purex Process streams, 11: 11585
determination in Redox stream by oxalate method, 11: 8380(R)
determination in solutions of $Na_2Cr_2O_7$, $Al(NO_3)_3$, and $UO_2(NO_3)_2$, 11: 8292
determination in Thorex Process streams, 11: 3697
determination in $Th(NO_3)_4$, 11: 10812(R)
dissolution of Al–U alloys in, 11: 2819(J)
distillation of Ru in, 11: 11623
distribution coefficient, effect of concentration on, 11: 7522(R)
distribution in kerosene and thorium nitrate systems, 11: 9889(R)
formation in Argonne Pile moderator, 11: 9584
handling and toxicity, 11: 985
heat transfer and frictional pressure drop, equipment for determining, 11: 10060
ion exchange estimation in $UO_2(NO_3)_2$ of free, 11: 5219(J)
liquid-vapor equilibrium in HNO_3–H_2O–F^- system, 11: 4318, 10437(J)
recovery from Purex Process wastes, 11: 7708(R), 11568
neutralization in Redox ICU and IAW streams, 11: 12998
nuclear magnetic resonance of N^{14} in, 11: 2849(J)
recovery by electrodialysis of TBP waste solutions, 11: 6680
recovery from aqueous raffinate, 11: 8336
recovery from combined raffinate streams, 11: 7424
recovery from ore processing solutions, 11: 5092(P)
recovery from Purex Process wastes, 11: 7708(R), 11568
recovery from raffinate by fractional distillation, 11: 191(J)
recovery from TBP processes, cost analysis, 11: 6890
recovery in Slurex Process, jet-mixer for, 11: 9643

Nitric acid (cont'd)

refractory index, 11: 8279

solvent extraction by TBP, 11: 7481(R)

solvent partition and solvent properties, 11: 11626

solvent partition in hexone–$Ca(NO_3)_2$ solutions, 11: 6685(J)

solvent properties for $BiPO_4$, concentration effects on, 11: 13587

solvent properties for PuF_4, 11: 3770

solvent properties for $SrSO_4$, 11: 9255(R)

solvent properties for Ti, Hf, Zr, and Th, 11: 4470(J)

vapor pressure at 20°C, measurement of partial, and verification of Margules-Duhem equation, 11: 6752(J), 6753(J)

Nitric acid–aluminum nitrate–hydrofluoric acid–thorium nitrate systems
See Aluminum nitrate–hydrofluoric acid–nitric acid–thorium nitrate systems.

Nitric acid–butyl phosphate–heptane systems
See Butyl phosphate–heptane–nitric acid systems.

Nitric acid–butyl phosphate–kerosene systems
See Butyl phosphate–kerosene–nitric acid systems.

Nitric acid–butyl phosphate–kerosene–thorium nitrate systems
See Butyl phosphate–kerosene–nitric acid–thorium nitrate systems.

Nitric acid–butyl phosphate systems
See Butyl phosphate–nitric acid systems.

Nitric acid–butyl phosphate–thorium nitrate systems
See Butyl phosphate–nitric acid–thorium nitrate systems.

Nitric acid–butyl phosphate–uranyl nitrate systems
See Butyl phosphate–nitric acid–uranyl nitrate systems.

Nitric acid–hydrochloric acid systems
See Hydrochloric acid–nitric acid systems.

Nitric acid–hydrofluoric acid systems
See Hydrofluoric acid–nitric acid systems.

Nitric acid–nitrogen oxide systems

exchange reactions for N^{15} production, 11: 1229(R)

isotopic exchange, 11: 9214

Nitric acid–2-pentanone, 4-methyl- systems

chemical stability, 11: 8278

toxicity and explosion hazards, 11: 985

Nitric acid–phosphoric acid–thorium oxide systems

thermal stability, 11: 10973

Nitric acid–plutonium nitrate systems

corrosive effects on Ti, Ta, and stainless steel, 11: 3814

Nitric acid–sulfuric acid systems

distillation, 11: 5766(J)

Nitric acid–thorium nitrate systems

phase studies, 11: 7858(R)

Nitric acid–thorium nitrate–water systems

phase studies, 11: 9587(R)

Nitric acid–uranyl nitrate systems

corrosive effects on Ti–stainless steel couples, 11: 12317(R)

freezing and boiling points and vapor-liquid equilibria, 11: 12416(R)

Nitric acid–uranyl nitrate–water systems

boiling point elevation, vapor pressure and density, 11: 11658

Nitrides

infrared spectra of inorganic, 11: 12711(J)

physico-chemical properties of refractory transition element, 11: 11928(J)

Nitrites

colorimetric determination in minute quantities, 11: 11090(J)

determination in aqueous and non-aqueous $UO_2(NO_3)_2$, 11: 6249

formation in irradiated nitrate solution, 11: 1799

gasometric determination in the presence of foreign ions and diluents, 11: 2266

spectrophotometric determination, 11: 1799

spectrophotometric determination in HNO_3 and H_2SO_4, 11: 12973(R)

Nitrobenzene
See Benzene, nitro-.

Nitrogen

adsorption from H gas streams on silica gel at low temperatures, 11: 11989

adsorption on graphite, 11: 7959(J)

analysis for UF_6, 11: 11511(P)

atmospheric, N^{15}/N^{14} ratio in, variations of, 11: 8001(J)

chemical determination in U derbies, 11: 10810(R)

chemical reaction kinetics, 11: 10231(R)

compressibility of solid, and phase transition, 11: 2960(J)

cosmic ray nuclear interactions in, 11: 12088(J)

cover gas in Na systems, 11: 3398

cryogenic data, 11: 386

determination in D_2 and H_2, 11: 7108

determination in Th, 11: 12406(R)

diffusion into transition metals of IV, V, and VI groups on periodic system, 11: 1534, 11229(J)

electron drift velocity in, 11: 4916(J)

electron scattering by, at low energies, 11: 5654(J)

energy loss of slow electrons in, 11: 13373(J)

exchange reactions, 11: 8557(R)

excitation by protons of a few kev energy, 11: 10775(J)

fixation by radiation in Argonne Pile, 11: 9584

gasometric determination in Pu, U, and Zr, 11: 3339

gasometric determination in U and UH_3, 11: 12349

interactions of nucleus of, with emulsion nuclei, 11: 4720(J)

ion pair production by β particles, absolute energy for, 11: 12764(J)

isotopic exchange reactions, 11: 9214

luminescence, α-ray induced, 11: 8971(J)

melting up to 3500 kg/cm^2, volume change, 11: 4903(J)

microchemical determination in organic compounds, 11: 12339(R)

neutron elastic scattering cross sections, 11: 2174(J)

photoprotons from bremsstrahlung irradiated, 11: 12908(J)

proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)

protons scattered at 96 Mev by, energy spectrum, 11: 612(J)

radiation chemistry, mechanisms of, 11: 11953(J)

radiation effects on energy exchange and discharge processes in, 11: 6566(J)

reactions with Hf, 11: 4461

solubility in biphenyl, isopropyl- at atmospheric pressure and temperatures to 125°C, 11: 5406

spark discharge spectra of, effects of composition, pressure, and gap length, 11: 10612(J)

spectrophotometric determination in H_2SO_4, 11: 12973(R)

spectrophotometric determination in Zr and Zircaloy, 11: 12676

thermal conductometric analysis for H_2, 11: 2272

Nitrogen (cont'd)
thermodynamic properties, calculation of ideal-gas, 11: 12788
vacuum fusion determination in La, 11: 3706(J)
vacuum fusion determination in metals, 11: 4826
vacuum fusion determination in metals, B, and Si, 11: 4308(J)

Nitrogen (liquid)
boiling in short narrow channels and use as magnet coolant, 11: 6338(J)
cryogenic data, 11: 386
π-meson photoproduction cross section in, 11: 6484(J)
requirements for low-temperature irradiation facility at MTR, 11: 2692

Nitrogen–argon systems
See Argon–nitrogen systems.

Nitrogen–carbon dioxide systems
See Carbon dioxide–nitrogen systems.

Nitrogen–hydrogen systems
See Hydrogen–nitrogen systems.

Nitrogen ion beams (N^{14})
alpha activity induced in Pt, 11: 3099(J)
reactions with Os, 11: 2076(J)

Nitrogen ions
Coulomb excitation by, comparison with protons, 11: 692(J)
Coulomb excitation of nuclei by, 11: 4067(J)
linear energy transfer in tissue, 11: 4245(J)

Nitrogen isotopes
abundance ratio in igneous rocks, 11: 10626(J)
abundance variations, 11: 5374(J), 5951(J)
fractionation in NO and NO_2, 11: 2850(J)
separation, 11: 9664(R)
separation of N^{14} and N^{15} by ion exchange, 11: 4810(R)

Nitrogen isotopes N^{13}
energy levels, 11: 4716
first excited states, calculation, 11: 4975

Nitrogen isotopes N^{14}
bremsstrahlung reactions (γ,p), 11: 5365(R)
deuteron reactions (d,α), energies of, 11: 2088(J)
deuteron reactions (d,n), angular distribution and energy spectra of neutrons, 11: 715(J)
deuteron reactions (d,n), neutrons from, 11: 12270(J)
deuteron reactions (d,p) and (d,t), 11: 3008, 4711(J)
deuteron reactions (d,p), energies of, 11: 2088(J)
energy levels at 8.06 and 8.70 Mev, 11: 12207(J)
energy levels at 8.06 and 6.23 Mev, 11: 5002(J)
energy levels in, studied by reaction $C^{13}(p,\gamma)N^{14}$, 11: 4124(J)
energy transfer reactions, theory, 11: 2039(J)
gamma rays from 8.06-Mev level, 11: 6518(J)
gamma reactions (γ,n) near threshold, 11: 6865(R)
gamma resonance absorption by, 11: 599(J)
helium nucleus reactions (N^{14},pγ), 11: 6494(R)
neutron reactions (n,d), cross sections, 11: 13521(J)
photoproton energy distribution, 11: 1542(R)
proton elastic scattering from 1.5 to 3.5 Mev, 11: 4048(J)
proton elastic scattering from 620 to 1820 kev, 11: 4051(J)
proton-excited energy levels in, 11: 2073(J)

Nitrogen isotopes N^{14} (cont'd)
proton reactions (p,γ), angular distribution of γ radiation from, 11: 6548(J), 10758(J)
proton reactions (p, p'γ), 11: 3049(J), 4016(R)
proton scattering angular distribution for, 11: 5058(J)
proton scattering by, optical model analysis, 11: 10773(J)

Nitrogen isotopes N^{15}
alpha reactions (α,γ), 11: 13468(J)
concentration, 11: 9214
concentration by exchange reaction of NO and HNO_3, 11: 1229(R)
concentration by isotopic exchange, process development, 11: 1227
deuteron reactions (d,nγ), γ rays from, 11: 7292(R)
deuteron reactions (d,p), 11: 1348(J), 6112(J)
deuteron reactions (d,p) and (d,α), 11: 3008, 4711(J)
neutron total cross sections of, in energy range 2.8 to 3.3 Mev, 11: 603(J)
positive parity states of, shell model for, 11: 6056(J)
production by chemical exchange, cost estimates, 11: 1226, 8554, 10905
proton reactions and energy levels of O^{16}, 11: 7292(R)
proton reactions (p,αγ) and excited states of O^{15}, 11: 1274(R)
proton reactions (p,αγ) and (p,γ), gamma radiation from, 11: 6934(J)
proton reactions (p,γ) up to 4 Mev, 11: 4712(J)
proton reactions (p,n), threshold and absolute cross sections, 11: 10232(R)
proton reactions (p,n)O^{15} threshold, 11: 10687(R)
separation, 11: 13985(R)
separation, developments on industrial scale, 11: 12127(J)
separation, Nitrox system for, 11: 12513(R)
separation-methods for concentration of, 11: 8557(R)
spin orbit forces, 11: 1638
use in breeder reactors, power cost associated with, 11: 2111

Nitrogen isotopes N^{16}
energy levels from reaction $N^{15}(d,p)N^{16}$, 11: 1348(J), 4649(J)
formation in deuteron-induced reaction, 11: 6112(J)
radioactivity, 11: 4707

Nitrogen isotopes N^{17}
radioactivity, 11: 4707
thermal neutrons from, spatial distribution in water, 11: 6859(J)

Nitrogen oxide–nitric acid systems
See Nitric acid–nitrogen oxide systems.

Nitrogen oxides
decomposition by impact of fission fragments of U^{235}, 11: 11962(J)
distillation, nitrogen isotope effect, 11: 4818(J)
exchange reactions for N^{15} production, 11: 1229(R)
infrared absorption determination, 11: 2265
isotopic fractionation, in NO and NO_2, and mass discrimination in, 11: 2850(J)
molecular structures, exchange reactions, nuclear magnetic resonance of N^{14} labeled-, 11: 2849(J)
oxidation of CO by, carbon isotope effect, 11: 7096(J)
production by irradiation of air, 11: 2301
reactions with Cr, Zn, and U, 11: 1025(J)
solubility of NO in various solvent, 11: 11566(R)

Nitrogen oxides (cont'd)

toxicity, 11: 985

vibration-rotation band of $N^{15}O$ fundamental, 11: 12303(J)

Nitrogen–oxygen systems

cryogenic data, 11: 386

thermodynamic properties from 2000 to 15,000°K, 11: 443

Nitrogen–thorium systems

composition studies, 11: 8492(R)

Nitrogen–uranium systems

composition equilibria, effects of pressure and temperature, 11: 13788(R)

Nitrous acid

infrared absorption coefficients for DNO_2, 11: 4825

infrared absorption coefficients for gaseous mixtures of NO, NO_2 and H_2O, 11: 4825

Noise

fatigue effects on mice, 11: 9906

Nomenclature
See Glossaries.

Nomographs

for calculating heat transfer in fluidized beds, 11: 8897(J)

for fission product radioactivity analysis, 11: 11260

gamma attenuation with buildup in Pb and Fe, 11: 3620(J)

of gamma-ray shielding, 11: 1701(J)

Non-destructive testing
See Materials testing.

Nonelectrolytes

(See also Electrolytes.)

diffusion in aqueous solutions, 11: 93(J)

theory, critical phenomena, thermodynamic properties, and phase equilibria, review, 11: 4498(J)

Norsk Hydro's Inst. for Cancer Research, Oslo

research programs and facilities, 11: 8806

North American Aviation, Inc., Downey, Calif.

progress reports, 11: 7850(R), 13113(R)

progress reports on chemical development, 11: 12331(R)

progress reports on high-temperature materials studies, 11: 7599(R)

progress reports on radiation effects, 11: 7889(R), 9611(R)

progress reports on reactor development, 11: 8547(R), 8685(R), 8696(R), 13966(R)

progress reports on reactor physics, 11: 7842(R), 7843(R), 7845(R), 8691(R), 12508(R)

progress reports on reactor safety, 11: 8689(R)

progress reports on separations chemistry, 11: 7542(R), 7543(R), 7544(R), 7545(R), 7546(R), 8386(R), 8387(R), 8388(R)

progress reports on sodium graphite reactors, 11: 7847(R), 7848(R), 8686(R), 8687(R), 8688(R), 12575(R), 13968(R)

progress reports on solid state and irradiation physics, 11: 7693(R)

progress reports on titanium alloy development, 11: 4456(R), 4457(R)

progress reports on UPR, 11: 7844(R)

North American Aviation, Inc. Los Angeles, Calif.

progress reports on radiation sterilization of foods, 11: 11023(R)

North American Aviation Reactors
See Low Power Research Reactor; Neutron Production Reactor; Sodium Reactor Experiment, Uranium Production Reactor; Water boiler neutron sources.

North Carolina

exploration for Th and radioactive black mineral deposits, 11: 3825

North Carolina (Burke Co.)

geophysical exploration of Silver Creek area in, 11: 3404

North Carolina (McDowell Co.)

geophysical exploration of South Muddy Creek area in, 11: 3404

North Carolina (Rutherford Co.)

exploration of Sandy Run Creek Area in, 11: 4436

North Carolina Research Reactor

operation, 11: 591(J)

North Dakota

mineral determinations in U deposits in, 11: 5317

uranium deposits, collected field material on, 11: 6356(R)

uranium occurrence in black shale deposits of, 11: 3409(J)

North Tygre River Placer Area (S. C.)

geology, mineralogy, monazite occurrence, geophysical exploration, 11: 3820

Northwest Electro-Development Lab., Albany, Oreg.

progress reports on thorium research, 11: 12333(R)

progress reports on Zr and Hf production, 11: 13767, 13768(R)

Norway

fall-out monitoring between July and Dec. 1956, 11: 13246

Notom Quadrangle (Utah)

preliminary geologic map, 11: 9300(J), 9301(J), 9302(J), 9303(J), 9304(J), 9305(J), 9306(J), 9307(J), 9308(J), 9309(J), 9310(J), 9311(J), 9312(J)

Nozzles

(See also Rocket motor nozzles; Turbine nozzles.

design of transparent-wall, 11: 4412(R)

design of venturi for Na flow cavitation studies, 11: 13710

fatigue resistance in simulated, in model pressure vessels, 11: 8935(J)

testing of, for high ratio of operating to standby flow resistance in orifice, 11: 13045

NPD Reactor

design of, and power plant, 11: 9463

NPR Reactor
See Neutron Production Reactor.

NRU Reactor

control and safety, 11: 9100

control rod mechanism testing, 11: 2027(R)

design and uses, 11: 13(J)

economic studies, 11: 668(J)

in-pile loop reactivity load, calculation, 11: 10726

radiation monitoring, 11: 1320

reactivity effects of irradiation, 11: 5016

shielding and heat production calculations for, handbook, 11: 6893

temperature control design, 11: 2027(R)

thermal shield, corrosion problems, 11: 1864

NRX Reactor

control system, automatic, 11: 9473

NRX Reactor (cont'd)

design, fuel irradiation characteristics, and temperature and transient poison effects, 11: 682(J)

design and use, 11: 13(J), 2134(J)

economic studies, 11: 668(J)

experimental facilities, design and testing of Central Thimble Zircaloy-2 loop, 11: 10301

fuel element temperatures, comparison with Pu production reactor, 11: 13972

fuel elements, analysis of irradiated U and estimation of effective cross sections, 11: 11406

fuel rod reactivity studies, 11: 3571(J), 5018, 7690(R)

neutron densities and critical Laplacian in, calculations, 11: 3075

neutron flux decay after shutdown, 11: 6078

neutron leakage and death rates in, 11: 3076

operation, control, and research utility, 11: 11405

reactivity transient caused by poisoning, 11: 12526

reflectors, calorimetric determination of energy deposition in J-rod annulus, 11: 11404

temperature coefficients of reactivity, 11: 6527

thermal shield, corrosion problems, 11: 1864

vessels, design, fabrication and materials, 11: 5017

Nuclear aircraft

(See also Aviation personnel; Nuclear aircraft power plants.)

design considerations, 11: 3269(J)

radiation dose from radioactive jet engine systems panel, 11: 10174

radiation effects, program for determining, 11: 2180, 2181, 2182, 2183

remote handling and maintenance experiments, 11: 8891

Russian project, 11: 9119(J)

Nuclear aircraft power plants

(See also Aircraft reactors; Nuclear aircraft.)

design considerations, 11: 3269(J)

Nuclear batteries

(See also Photoelectric cells.)

converting nuclear to electric energy, 11: 3638(P)

current voltage characteristics, 11: 449(R)

design and performance, 11: 2, 448(R), 450(R)

development, 11: 449(R)

fission energy conversion in Ge, 11: 2546

Nuclear chemistry

(See also Radiochemistry; Tracer techniques.)

book on history, scope, applications, 11: 10440(J)

cosmic occurrence of elements above mass number 70, 11: 1542(R)

fission process studies, 11: 168(J)

separation of target nuclei by recoil method for endoenergetic reactions, 11: 1466

Nuclear Cross Sections Advisory Group, AEC

minutes of meeting May 24 and 25, 1955, at Berkeley, 11: 13858

reports of the Houston meeting, Feb., 1956, 11: 13116

Nuclear Development Corp. of America, White Plains, N. Y.

progress reports on boiling burnout, 11: 5835(R), 6705(R)

progress reports on reactor heat transfer, 11: 5836(R), 5837(R)

Nuclear dipole moments

See Nuclear electric moments; Nuclear magnetic moments.

Nuclear electric moments

(See also Nuclear magnetic moments.)

analysis of quadrupole, on basis of kinematical model, 11: 4190(J)

relation of quadrupole, to nuclear core rigidity, 11: 5521(J)

Nuclear emulsions

(See also Photographic emulsions; Photographic film detectors.)

absorption of slow π mesons by elements in, 11: 9017(J)

affixing grid coördinates for location of events, 11: 10118(J)

alignment and coordinate system for stacks, 11: 496

alpha tracks in, exposed in air with a high radon content, 11: 3494(J)

application to thermal neutron detection, 11: 6815

contraction factor, 11: 1986(J)

cosmic radiation measurements with, summary, 11: 4504

design of camera using, 11: 7278(J)

detection of parent stars of K^+ mesons in, 11: 8953(J)

development at low temperatures, 11: 8084(J)

diffusion of radioelements in, at low temperatures, 11: 5458(J)

disintegration of heavy nuclei in, by particles of cosmic radiation, 11: 8041(J)

disintegrations of light nuclei in, by slow π^- mesons, 11: 694(J)

dissolution of silver grains in the fixer, 11: 1596(J)

distortion vectors in, determination, 11: 9014(J)

double stars in, due to 220-Mev π^- mesons, 11: 2999(J)

electron-photon cascades in, at high energies, 11: 5507(J)

electron range-energy relation, 11: 6133(J)

electronic scanner for, 11: 1996(J), 3003(J)

energy response and track lengths of NTA films, 11: 9188(R)

errors in constant-sagitta scattering measurements in, 11: 3495(J)

fast neutron detection with, 11: 3497(J)

identification of fast charged particles in, 11: 6822(J)

identification of particles in, 11: 3960(J)

identification of proton and deuteron tracks in, by grain-counting techniques, 11: 4118(J)

interaction of nitrogen nucleus with nuclei in, 11: 4720(J)

ionization measurements in, 11: 492(J)

latent image fading in Ilford G-5, 11: 5966(J)

linear distortion in range 15 to 24°C, 11: 3961(J)

mass measurements on particles stopping in, by the constant sagitta method, 11: 9009(J)

mercury-loaded, preparation for photodisintegration study, 11: 10179(J)

meson (K^+) interactions with nuclei of, from 40 to 160 Mev, 11: 5983(J)

meson (π^-) interaction lengths and diffraction scattering in, at 4.2 Bev, 11: 4952(J)

meson (π^-) mean free path in, at 4.3 Bev, 11: 5473(J)

mesons (π^-) produced by cosmic rays in, energy spectrum, 11: 3898(J)

multiple scattering of elementary particles in, measurement by Klausen micrometer, 11: 9015(J)

multiple scattering of 2.4-Mev electrons in, 11: 3190(J)

neutron and γ ray spectra measurements in JEEP with, 11: 11414

neutron energy resolution of Li-loaded, 11: 11744(R), 12157(J)

neutron spectra studied with, 11: 591(J)

pair production in, 11: 4966(J)

parameters most sensitive to variation of particle speed in, 11: 8085(J)

photostar production in, by 250- to 500-Mev bremsstrahlung, 11: 6115(J)

pion production in, by 660-Mev protons, 11: 3990(J)

Nuclear emulsions (cont'd)
preparation, 11: 5445(J)
processing techniques, 11: 9011(J)
proton ranges in, at 87, 118, and 146 Mev, 11: 6140(J)
proton recoil tracks in, analysis of errors in measurement, 11: 6856
range-energy relations of Li^7 ions in, 11: 5648(J)
range-energy relations of $3 \leq Z \leq 10$ ions in Ilford C_2, 11: 6556
relation between blob density and velocity of singly charged particle in G-5, 11: 5973(J)
research programs, 11: 6493
scattering of α tracer ions in moist, 11: 1987(J)
shrinkage in, inhibition of, 11: 10189(J)
spectrograph design using stacks of, for charged particles momentum determinations, 11: 4945(J), 4946(J)
spurious scattering in, 11: 5972(J)
for study of β radiation, 11: 1951(J), 10590(J)
track measurement techniques, 11: 511(J)
track measurements in, mechanical device for, 11: 1992(J)
tracks in, photometric analysis, 11: 3493(J)
water loading, effects, 11: 8093(J)

Nuclear engineering
(See also Reactor engineering.)
books, 11: 10318(J)
conferences on manpower needs and educational programs in, 11: 6185
reactor shielding design, 11: 2710
safety, fuel production, and heat transfer problems, 11: 13516(J)

Nuclear explosions
See Atomic explosions.

Nuclear forces
See Nuclear theory.

Nuclear fusion reactions
See Thermonuclear reactions.

Nuclear induction
of chlorine^{35} in liquids, 11: 601(J)

Nuclear isomers
determination, nuclear magnetic absorption, 11: 6012(J)
excitation by x rays from 75-Mev synchrotron, 11: 4632(R)
octupole, transitions in odd A, 11: 3533(J), 11365(J)
short-period, produced by proton bombardment, 11: 2149(J)

Nuclear magnetic moments
(See also Nuclear electric moments.)
contribution to radiative pion-nucleon scattering, 11: 9061(J)
empirical regularities, 11: 7299(J)
dipole transitions, 1-forbidden, 11: 13481(J)
interference phenomena between parity doublets, 11: 1632(J)
isomeric transitions on L shell at 57.6 kev in Hf^{180m}, 11: 6514(J)
multiple quantum transitions, 11: 8025(R)
of nuclei, octupole, 11: 13477(J)
polarization method of measuring velocities of particles with intrinsic, 11: 12944(J)
significance in many-body problems, 11: 4020(J)
spin-orbit interaction in, 11: 12951(J)
for two-nucleon systems, 11: 2046(J)

Nuclear magnetic resonance
absorption in strongly magnetic materials, 11: 2033(J)
cryostats and mechanical stage for studies, 11: 6793(J)
detection and measurement, design of high-resolution, low-field spectrometer for, 11: 6443
detector design, 11: 454
free-induction decay shape theory, nuclei in rigid lattices, 11: 10694(J)
heterodyne detection of free precession in, 11: 10788(J)
in hydrogen-bonded systems, 11: 9070(J)
isotopic analysis, theory, 11: 6012(J)
magnet stabilization and control in studies of, 11: 10713(J)
method for observing, 11: 597(J)
observation of chemical shielding and spin coupling of C^{13} nuclei using, 11: 6004(J)
phase detector for observation at low frequencies, 11: 4921(J)
radiation damping and resonance shapes in high-resolution, 11: 1281(J)
research at MIT, 11: 8025(R)
saturation by, theory, 11: 7306(J)
signal distortion effects on magnetic measurements, 11: 8131(J)
in spectra of symmetrical molecules in the liquid state, 11: 10018(J)
a review, 11: 4636(J)
sample spinning and field modulation effects, 11: 1280(J)
shape of dispersion signal in, 11: 4208(J), 6171(J)
spectrometers, device for heating samples in, 11: 4758(J)
spectrometers, low-field, 11: 12122(J)
spectroscopy of organic compounds, 11: 3330(R)
studies of molecular motion in solids and populations of energy levels in electron excited atoms, 11: 13358(R)
theory, experimental procedures, applications, and bibliography, 11: 3009
theory and experimental methods, review, 11: 561(J), 6426(J)

Nuclear Metals, Inc., Cambridge, Mass.
progress reports, 11: 9332(R), 10560(R), 11710(R), 12490(R), 12288(R)
progress reports on fuel element development, 11: 13806(R)
progress reports on research and development in metallurgy, 11: 7683(R), 8524(R), 11711(R), 11715(R), 12491(R)

Nuclear models
alpha decay of deformed nuclei as given by unified, 11: 13447(J)
alpha particle, and interaction between α particles, 11: 5511(J)
alpha-particle, and polarization forces between α clusters in nuclei, 11: 6503
analysis of oscillator and collective, 11: 2027(R)
for calculating moments of inertia, 11: 9066(J)

Cloudy Crystal Ball, for neutron-nuclei reaction kinetics, 11: 6801
collective and shell basis of magnetic octupole moment, 11: 13477(J)
compound, for heavy particles, 11: 6984(J)
descriptions of, used in particle scattering studies, 11: 12843
eigenvalues and eigenfunctions of a Bose system of hard spheres and its low-temperature properties, 11: 10381(J)
for excitation of heavy nuclei, 11: 804(J)
with finite coefficient of absorption and fuzzy boundary, examination, 11: 2024(J)
independent-particle, approximate analytical wave functions for, 11: 3018(J)

Nuclear models (cont'd)
independent-particle, nucleon densities in diffuse-boundary, 11: 3019(J)
for K^- particle capture on bound protons, 11: 10668(J)
kinematic, and empirical determinations of nuclear shape factors and moments of inertia, 11: 9449(J)
nuclear electric hexadecapole moments in shell, liquid drop, and collective, 11: 13439(J)
for nucleon inelastic scattering, 11: 13542(J)
nucleon-nucleus interaction from statistical, 11: 6014(J)
one-dimensional nucleon-nuclear wall model, 11: 12851(J)
perturbation approach to Fermi gas, of heavy nuclei, 11: 9439(J)
photonuclear reactions and the giant resonance, 11: 11455(J)
potential well, analysis of fast neutron scattering data for, 11: 7285
potential well, cloudy crystal ball, black nuclear, etc., as applied to neutron spectrometry, 11: 10229
quantum field theory, 11: 805(J)
quantum-mechanical behavior, 11: 11740(R)
relation between collective and individual particle, with configurational mixing, 11: 13435(J)
scattering of high-energy electrons on independent-particle, 11: 757(J)
self-consistent, surface energy and thickness, 11: 2037(J)
shell, optical, and cloudy crystal ball, 11: 10232(R)
single-particle, analysis of gamma transitions, 11: 3531(J)
statistical, for uniform and nonuniform density distributions of nucleons, 11: 4202(J), 12947(J)
strong couplings, 11: 10217(J)
theory of independent-particle central-field, 11: 6175(J)
unified, theory, 11: 7297(J)
viscous fluid, multiple meson production in, 11: 10203(J)

Nuclear models (collective)
collective rotational levels in, 11: 4018(J)
magnetic quadrupole moments and electromagnetic transitions in, 11: 5503(J)
theory, 11: 8130(J)

Nuclear models (drop)
modifications allowing for non-uniform nuclear charge and mass density distribution, 11: 4618(J)

Nuclear models (optical)
and attenuation cross sections of antiproton beams, 11: 13478(J)
and compound nuclear theory, 11: 10243(J)
computations with, 11: 6502
determination of neutron reaction cross section by, 11: 583(J)
elastic scattering of alpha particles, 11: 10348(J)
meson(K^+)-nuclei scattering according to, 11: 6139(J)
neutron polarization in (p,n) reactions calculated by, 11: 3015(J)
neutron scattering by, 11: 3196(J)
for nucleon-nucleus elastic scattering, 11: 3096(J)
for production of Σ hyperons in nuclei by K^- mesons, 11: 10669(J)

Nuclear models (shell)
application to singel light nuclei, 11: 7305(J), 7307(J)
collective motion in, 11: 8134(J)
collective motions of many-body system described by, 11: 8130(J)
connection to nuclear deformability, 11: 4024(J)
energy levels in Li^7 and Be^7, interpretation, 11: 12206(J)
harmonic oscillator, calculations in nuclear spectroscopy with, 11: 4185(J)
Mayer's, competition between shells in, 11: 562(J)

Nuclear models (shell) (cont'd)
particles and holes in, theory, 11: 567(J)
photon reactions, individual particle and collective aspects, 11: 12274(J)
photonuclear total adsorption cross sections, calculations based on, 11: 10709(J)
proposed, and classification of atomic nuclei by, 11: 2056(J)
reduced stripping width calculated by, 11: 6872(J)
review of theory, 11: 7707, 8133(J)
spin-orbit coupling and tensor forces, 11: 11352(J)
stability of shells and subshells, 11: 586(J)
structure and energy levels, 11: 9438(J)
studied by deuteron stripping reactions, 11: 5516(J)
tensor coupling and vector, 11: 5685(J)
validity of, role of nucleon-nucleon correlations and Pauli principle in establishing, 11: 4613
wave functions for excited states, derivation, 11: 580(J)
weak collective effects, 11: 10269(J)

Nuclear models (spheroidal)
Bohr-Mottelson, Np^{237} energy level study, 11: 10760(J)

Nuclear moments
See Nuclear electric moments; Nuclear magnetic moments.

Nuclear particles
(See also Elementary particles; Nucleons; Radiation.)
angular correlations and polarization of spin $\frac{1}{2}$ and $\frac{3}{2}$, 11: 13431
beam intensities of proton, deuteron, Be, C^{12}, C^{13}, N, and O, 11: 1923(R)
electromagnetic properties of, with spin, 11: 9082(J)
high-energy, developments reported at Moscow Conference on, 11: 2954(J)
oscillations in magnetic fields, 11: 3182(J), 3183(J)
polarized, tensor momenta of, 11: 4203(J)
scattering matrix for intermediate system, 11: 4146(J)
scattering of high-energy, 11: 8207(J)
showers in nuclear emulsions, 11: 2171(J)
slowing down, 11: 10691(J)
of spin $\frac{1}{2}$, equivalence of tensor and spinor descriptions, 11: 10235(J)

Nuclear physics
angular momentum, book, 11: 11367(J)
annihilation mode of nucleon-antinucleon system into a K-anti-K pair, 11: 565(J)
atomic mass formula revisions, 11: 9054(R)
calculation of effective atomic number for compounds and mixtures, 11: 6760(J)
charge distribution and electric radius of heavy nuclei, 11: 3522(J)
collective nuclear motion and effective mass of a nucleon, 11: 1623(J)
conference on elementary particles, 11: 5504(J)
conservation laws for weak interactions, 11: 5512(J)
contributions of optical methods to, 11: 8235(J)
Coulomb excitation, quantum calculation, 11: 3020(J)
Coulomb excitation, tables of classical orbital integrals in, 11: 3011(J)
Coulomb phases and amplitudes taking into account the finite nuclear size, tables, 11: 6870(J)
decay processes, dispersion relations, 11: 3540(J)
electronic techniques for, 11: 6505(J)
energy level repulsion, 11: 4019(J)
energy saturation of nuclear matter, 11: 12068(R)
exchange magnetic moment of the two-nucleon system, 11: 2046(J)

Nuclear physics (cont'd)

excited states of the nucleus, theory, 11: 12844(J)

experiments in, survey, 11: 13834(R)

fundamental concepts of, 11: 12187(J)

isotopic spin impurities, 11: 5542(J)

magnetic moments of nuclei in many-body problems, 11: 4020(J)

mass corrections in relativistic quantum field theory, 11: 4016(R)

multipolar electromagnetic radiation applied to, 11: 591(J)

natural radioisotopes in, 11: 12934(J)

nuclear force theory, intermediate coupling meson, 11: 2051(J)

nuclear moments of inertia due to nucleon motion in rotating well, 11: 572(J)

nuclear propagation function in quadratic approximation, 11: 4017(J)

nuclear reaction products, angular distribution, 11: 2045(J)

nucleomesodynamics in strong coupling, 11: 585(J)

nucleon-nucleon potentials, calculation of phenomenological, 11: 4022(J)

numerical solutions of many-body problem, 11: 6017

parity conservation in π-μ-e decay, 11: 6018(J), 6847(J), 7302(J)

parity nonconservation and the group-space of the proper Lorentz group, 11: 12068(R)

plane wave representation of spin-$\frac{1}{2}$ particles, 11: 4614(R)

plastics used in high-energy research in, 11: 3442

quadrupole coupling, effect of atomic core, 11: 4021(J)

quantum theory of angular momentum, 11: 11248

radiation widths of nuclear energy levels, 11: 7296(J)

reactions, transmutation, and isotopes, 11: 2551

regular formulation of quantum field theory, 11: 2052(J)

relation between the quadrupole moments and giant resonance widths of photonuclear reactions, 11: 2047(J)

research at AECL, 11: 13(J)

review of progress in 1956, 11: 5500(J)

scattering phenomena, theory, 11: 743(J)

selection rules for γ transitions in highly deformed spheroidal nuclei, 11: 4814(R)

Soviet, review, 11: 3012(J), 3013(J)

survey of applied nuclear physical chemistry, 11: 589(J)

pion theory of nuclear forces, 11: 2050(J)

thermodynamic properties of mixtures on statistical model, 11: 549

theoretical and experimental, progress on, 11: 7692(R)

Wigner-Eisenbud relation for the R matrix, 11: 4016(R)

Nuclear physics conferences

held at Gatlinburg, Tenn., Nov. 1 and 2, 1956, 11: 10229

on high-energy particles at Moscow, May 14-22, 1956, 11: 2054(J)

history of International Conference on the Peaceful Uses of Atomic Energy, Geneva, 1955, 11: 6189(J)

on manpower needs in atomic energy programs and engineering education at Gatlinburg, Tenn., Sept. 5-8, 1956, 11: 6185

papers from, on elementary particles at Pisa, June 12-18, 1955, 11: 5504(J)

proceedings of sixth annual, at Rochester, April 3-7, 1956, 11: 6506(J)

Nuclear power

(See also Nuclear aircraft; Nuclear aircraft power plants; Nuclear power plants.)

bibliography for United Kingdom program, 11: 7043

bibliography on, 11: 11013

Nuclear power (cont'd)

capital investment requirements, 11: 14(J)

chemical and metallurgical aspects, 11: 6187(J)

conference on industrial applications, 11: 13225(J)

conversion of U. S. combat fleet to, 11: 10389(J)

cost factors for EBWR, 11: 10744(J)

cost relations of power-breeder and natural U reactors, 11: 4681

development, 11: 8635

development in Czechoslovakia, 11: 9908(J)

development in USSR, 11: 11(J), 2121, 11832(J)

direct generation of electric power from fission energy, 11: 13833

economic aspects, 11: 13962

economic aspects in Britain, 11: 5127(J)

economic aspects in Canada, 11: 668(J), 5126

engineering and metallurgical aspects, 11: 3270(J)

engineering problems in, 11: 9910(J)

fuel sources, 11: 822(J)

industrial applications, conference at Harwell, Jan., 1957, 11: 13224

industrial aspects, 11: 1390, 1718(J), 4219(J), 6093

industrial growth, factors governing, 11: 7817

industrial opportunities for the South, work conference, 11: 8759(J)

for industrial uses, evaluation, 11: 13959

industrial uses and economic aspects, conference notes, 11: 11837(J)

industrial uses in sugar, pulp, and paper industries, 11: 12240(R)

nature and applications of, book, 11: 11015(J)

production, metallurgical problems in, 11: 8(J)

production costs of, effects of fuel irradiation time on, 11: 11780

production of, for industrial use, 11: 13917

programs for development at ORNL, 11: 13899

propulsion for commercial vessels, 11: 3(J)

prospects for achieving competitive, 11: 4779

research program review, 11: 7717

status and technological factors, book, 11: 10387(J)

from steady nuclear combustion in rockets, 11: 823(J)

survey of applied nuclear physical chemistry, 11: 589(J)

from thermonuclear reactions, 11: 7044(J)

Nuclear Power Demonstration Reactor
See NPD Reactor.

Nuclear power plants

blower power to pile output ratio, selection of economic, 11: 5589, 5590

capital and fuel costs, comparison to coal-fired steam plants, 11: 821(R)

closed cycle gas turbine, design, 11: 5600(J)

commercial feasibility analysis of graphite moderated reactors in, 11: 8710

comparison of British, 11: 4704(J)

construction underground, feasibility of, 11: 4665

data handling systems, 11: 3919(J)

design, 11: 11746(R), 13190

design, construction, and data sheet for Calder Hall Reactor, 11: 1334(J)

design, economics, and nuclear characteristics, 11: 12599

design, to be built at Hunterston, Scotland, 11: 3268(J), 5601(J)

design and cost factors of 200,000 kilowatt pressurized water reactor, 11: 6537

Nuclear power plants (cont'd)
design and cycle analysis, 11: 8583
design and safety, 11: 10276
design features of Scottish, 11: 4701(J)
design of, as an engineering problem, 11: 12250(J)
design of a 420 Mw Russian, 11: 11437(J)
design of British Berkeley, 11: 4703(J); 5607(J)
design of Canada's NPD facilities, 11: 9463
design of He-cooled, D_2O-moderated, natural U, 11: 6075
design of homogeneous thermal reactor for, 11: 13891
design of liquid metal fuel, 11: 13511(J)
design of power and generating equipment, 11: 2127(J)
design study of a heterogeneous boiling reactor, 11: 12583
design study of 180-Mw, 11: 12583
efficiency of coolant gas circuit and steam plant, 11: 10304(J)
engineering problems, 11: 5036(J)
feasibility of merchant ship, 11: 13978
fuel processing by batch and continuous methods, economic study, 11: 659(J)
gas-cooled, design and development of high-temperature, 11: 13961
gas turbine type, closed-cycle He, 11: 13915
heat-power cycles and prime movers, 11: 10948
industrial applications, 11: 7(J)
for industrial power production, design and cost evaluation, 11: 13959
preliminary study of 80,000-kw pressurized light water reactor, 11: 1331
pressurized water, coolant technology, 11: 247(J)
proposals for cooperative development in Europe, 11: 11014
for rockets, heat release problems, 11: 9122(J)
Russian, 11: 676(J)
safety features of fast-breeder-, 11: 4110(J)
steam plants for, cycle studies, 11: 13311
steam power cycle study for, 11: 2231
technical description of German, 11: 12259(J)
working-stress criteria, 11: 679(J)

Nuclear quadrupole moments
See Nuclear electric moments; Nuclear magnetic moments.

Nuclear quadrupole resonance
effect of impurities on, of Br^{79}, 11: 2060(J)
observation in metals, 11: 614(J)
relationship between moments and widths in photonuclear reactions, 11: 2047(J)
structural investigation using, 11: 9362(J)

Nuclear reactions
(See also Fission; Spallation; Thermonuclear reactions.)
angular correlation for cascade type, (a,bγ), 11: 3094(J)
angular distribution data, tables for transformation from laboratory system to center-of-mass system, 11: 9386
annihilation of nucleon-antinucleon system into K-anti K pair, 11: 9058(J)
Bohr compound nucleus and, analysis, 11: 9137(J)
catalysis by μ mesons, 11: 5515(J), 6937(J)
characteristics of proton-induced, at 140 Mev, 11: 6123(J)
charged particle production in high-energy, 11: 696(J)
comparison of n,p and p,p′, at intermediate energies, 11: 6124(J)
compound nucleus formation in, 11: 3096(J)
cross sections for n,p,d,t, and He^3, with light nuclei, 11: 6035
detection and measurement of (He^3, pγ), 11: 2027(R)
deuteron (d,n)He^3, design of self targets for and relation to H diffusion in metals, 11: 7318(J)
deuteron stripping, Born approximation method for calculating cross sections, 11: 4714(J)
disintegration of light nuclei by protons of 140 ± 6 Mev, 11: 9059(J)
effect of collective motions, 11: 582(J)
effective cross sections for, induced by bremsstrahlung radiation, 11: 5042(J)
energies, determination by deflection measurements, 11: 6505(J)
exchange effect in stripping reactions, 11: 13436(J)
excited states of even-odd and odd-odd, 11: 3532(J)
fast neutron component in photo-, 11: 5622(J)
gamma polarization effects in photo-, 11: 5620(J)
identification of specific atomic elements in substances by, 11: 1716(P)
induced by bremsstrahlung γ rays, calculation of effective cross sections, 11: 2061(J)
interpretation of nitrogen- and proton-induced, 11: 5627(J)
involving charged particles, applications in radioisotope production, 11: 12798
kinematics at relativistic energies, 11: 548
kinetics of neutron-nuclei, Cloudy Crystal Ball code for determining, 11: 6801
in light and heavy nuclei and at high energies, 11: 9067(J)
with mesons (μ), validity of Williams-Weizsacker method in treating, 11: 570(J)
models for photo-, 11: 4032(J)
multiple emission, 11: 12915(J)
multiple production of particles in high-energy, 11: 2168(J), 5699(J)
in nature, review, 11: 8159(J)
neutron polarization in (p,n), and nuclear optical model, 11: 3015(J)
non-local models of pion-nucleon and pion-hyperon, 11: 7301(J)
nuclear fusion probability in mesic molecules, 11: 12083(J)
nuclear interaction of hydrogen hypernucleus, 11: 12188(J)
nucleon surface interaction and the (p,n) reaction, theory, 11: 10322(J)
octupole isomeric transitions of, with odd A, 11: 3533(J), 11365(J)
photo-, bibliography on, 11: 11447
photo-, measurement, 11: 11450(J)
of polarized particles, theory, 11: 4203(J)
production of nuclear stars by γ quanta, 11: 4031(J)
properties of, applied to study of nuclear structure and stability, 11: 8132(J)
proton collisions with photons, electrons, mesons, and protons, data, 11: 6867
proton polarization in (d,p), calculation, 11: 6031(J)
relative cross sections for n-p, involving nuclei with several isotopes, 11: 5561(J)
resonance formula for, 11: 8543(R)
scattering and absorption cross sections, theory, 11: 8135(J)
statistical theory of, strength function, 11: 6577
statistical theory of artificially produced, 11: 1639(J)
in steady nuclear combustion, 11: 823(J)
in stellar evolution stages, 11: 3888(J)

Nuclear reactions (cont'd)

stripping theory of deuteron, 11: 4624(J)

studies of photo, 11: 591(J)

study of (γ,n), near threshold in medium elements, 11: 8193(J)

sum rule for optical, 11: 5619(J)

survey of capture, stripping, and pick-up, 11: 3096(J)

target separation by recoil, 11: 1466

temperature "outbursts" in body subjected to nuclear irradiation, 11: 2031(J)

theory and experiments on (γ,n), 11: 7338(J)

theory of deuteron induced, 11: 4197(J)

theory of deuteron stripping, 11: 4198(J)

theory of direct, 11: 6935(J)

theory of p-wave pion-nucleon, 11: 5074(J)

theory of strange-particle, hypothesis of charge independence applied to, 11: 6869

theory of stripping, 11: 3096(J), 7337(J)

weak interactions between old particles and beta decay, 11: 8136(J)

Nuclear reactors
See Reactors and specific reactors.

Nuclear rockets
See Rockets.

Nuclear showers

observation and study in nuclear emulsions, 11: 2171(J)

Nuclear spallation
See Spallation.

Nuclear spectra

calculations with the harmonic oscillator shell model, 11: 4185(J)

hyperfine structure lines and intermediate coupling, 11: 5369(R)

in light and heavy nuclei, 11: 9067(J)

theory, 11: 7297(J)

Nuclear spin

isobaric, and space-time reflections, 11: 9450(J), 12306(J)

measurement by neutron capture γ rays, 11: 11358

nucleon–nucleon scattering with, in opposite direction, 11: 4148(J)

orbit coupling in heavy nuclei, 11: 13476(J)

polarization of beam of spin one particles after elastic scattering by spin zero nuclei, 11: 9180(J)

spin-orbit coupling, 11: 2038(J)

spin selection rules, charge independence and the comparison of isobaric triplets, 11: 2036(J)

spin-spin coupling in hydrocarbons, 11: 7314(J)

spin-spin coupling of aromatic protons, contribution of π-electrons, 11: 10227(J)

spin-spin indirect coupling constants, sign determination, 11: 3010(J)

Nuclear structure

(See also Nuclear models.)

collective motion and deviations from sphericity, 11: 8134(J)

energy eigenvalues for a spherical well with exponentially diffuse boundary, 11: 591(J)

forces, transmutations, and constituent of nucleus, 11: 3880(J)

internal momentum distribution, 11: 595

neutron resonance data as related to, 11: 6033(J)

potential well depth, parameter study of, 11: 7712

radius and charge distribution, 11: 7298(J)

Nuclear structure (cont'd)

relation of neutrons to, 11: 3096(J)

shell effects on spacing of nuclear levels, 11: 554(J)

studied by Coulomb excitation, review, 11: 3521(J)

theory, 11: 8132(J)

Nuclear submarines

development, 11: 10389(J)

Nuclear Test Aircraft

frequency and voltage monitoring systems, 11: 3469

instrumentation, 11: 11328

monitoring system for γ radiation, 11: 1559

Nuclear theory

(See also Nuclear models.)

angular correlation of radiations with parallel angular momenta, 11: 9064(J)

application of meson theory to exchange magnetic moments, 11: 2046(J)

Bohr compound nucleus, analysis, 11: 9137(J)

calculations of effective nuclear potentials, 11: 6045(J)

charge independence of nuclear forces, 11: 1626(J), 8123(J)

charge properties of weak interactions, 11: 12847(J)

Chew-Low formalism for interacting boson-fermion systems, 11: 5077(J)

collective description of nuclear surface oscillation, 11: 1627(J)

commutation relations of interacting spinor fields, 11: 4616

of complex nuclei, effect of repulsive core, 11: 4625(J)

composite model for new unstable particles, 11: 7284(J)

composite particles of zero mass, 11: 10383(J)

compound, and the optical model, 11: 10243(J)

conservation of nucleons, 11: 6978(J)

construction of adiabatic nuclear potential, 11: 3026(J)

continued fraction approximants to the Brillouin-Wigner perturbation series, 11: 10382(J)

contributions of n-p polarization experiments to pion theory of nuclear forces, 11: 2035(J)

Coulomb penetration and Coulomb wave functions, calculations, 11: 6499

coupling, potential, 11: 3623(J)

coupling constants between two nucleons with pion theoretical potential, 11: 4199(J), 4200(J)

coupling constants in meson, kinematical test for relation between, 11: 13412(J)

decay process selection rule, generalization of hypothesis of charge independence, 11: 13437(J)

of deuteron stripping reactions, 11: 4198(J)

dimensionality of space charge, 11: 7380(J)

dipole sum rule with an approximate Hamiltonian, 11: 8241(J)

dispersion relations for class of fixed source meson theories, 11: 6168

effective mass in nuclear matter, 11: 8240(J)

eigenvalues and eigenfunctions of a Bose system of hard spheres and its low-temperature properties, 11: 10381(J)

electromagnetic properties of nucleons, effects of heavy mesons, 11: 1542(R)

electron effects on barrier penetration, 11: 6176(J)

of elementary particles, 11: 3629(J), 11354(J)

elementary particles, mathematical formulation of the Gell-Mann-Nishijima scheme for, 11: 13560(J)

Nuclear theory (cont'd)
energy of a many-particle system, 11: 1387(J)
equations for 3-dimensional extended particle, 11: 4760(J)
ergodic theorem for interacting systems, 11: 11488(J)
exchange effect in stripping reactions, 11: 13436(J)
existence of bound nucleon-Λ^0 state, 11: 568(J)
external Coulomb fields in the Wigner-Eisenbud, 11: 10240(J)
Fermi interactions, invariance properties of, 11: 12845(J)
fixed extended source pion theory, 11: 6172(J)
force, Fokker-Planck equation for inverse-square, 11: 10693(J)
formula for calculating nuclear moments of inertia, 11: 9066(J)
Heisenberg's non-linear field theory, inconsistencies in, 11: 2205(J)
interactions, time-reversal properties of weak decay, 11: 10795(J)
integral equations for meson field theory, 11: 5683(J)
interaction of P- and S-wave pions with fixed nucleons, 11: 3025(J)
interactions, coupling constants of strong, 11: 13410(J)
interactions, universality of weak, 11: 13472(J)
internal conversion dependence on nuclear structure in electric multipole transitions, 11: 11349
kinematics of β decay and parity nonconservation in weak interactions, 11: 12850(J)
level-density of Fermi particles, 11: 550(R)
light nuclei formation in expanding universe, 11: 7340(J)
Lüder's Theorem, experimental tests, 11: 11355(J)
many-body, accuracy of Born approximation, 11: 11351(J)
mass reversal and parity non-conservation, 11: 12846(J)
matrix aspects of boson theory, 11: 809(J)
μ-meson decay and the two-component neutrino, 11: 6987(J)
meson, high approximations in self-congruent field method, 11: 555(J)
meson, invariance properties and identities between renormalization constants. 11: 9412(J)
meson, renormalization constant identities in S(S) and PS(PS),
meson, review, 11: 8243(J)
meson field, dispersion relations in, 11: 9027
meson(π), of three-body forces, 11: 13438(J)
meson theory, conference on, 11: 5504(J)
mesons, hydrodynamical model in multiple production, 11: 3625(J)
model for weak interactions, 11: 10376(J)
nature of nuclear forces indicated by photodisintegration of the deuteron, 11: 5696(J)
neutrino, of weak interactions, 11: 12848(J)
neutrino mass and parity non-conservation, 11: 9084(J)
neutrinos, history of physics of, 11: 13433(J)
neutron-nucleus complex potential, real part, 11: 5510(J)
neutron–proton potentials, phenomenological, 11: 13432(J)
noninvariance under time reversal and charge conjugation, remarks on, 11: 6981(J)
non-linear meson field, of resting nucleon, 11: 2030(J)
non-linear pseudoscalar meson theory with vector coupling, 11: 1619(J)
note on mixed meson theory, 11: 5700(J)
nuclear forces in deuteron photodisintegration, 11: 2048(J)
nuclear hydrodynamics and energy width of gamma resonance, 11: 5530(J)
nuclear potential for K^+ mesons, 11: 10380(J)
nucleomesodynamics in strong coupling, 11: 2206(J)

Nuclear theory (cont'd)
nucleon magnetic moments in ps-ps intermediate coupling meson theory, 11: 5697(J)
nucleon-nucleon potentials, 11: 1628(J)
one-dimensional nucleon-nuclear wall model, 11: 12851(J)
parameter effects on uniform density distribution, 11: 12947(J)
parameters in expressions for neutron-proton potentials, 11: 6990(J)
parity conservation and neutrino mass, 11: 5508(J), 7303(J)
parity doublets and hyperfragment binding, 11: 6983(J)
parity nonconservation and neutrino theory, 11: 6016(J), 8121(J), 8124(J)
parity nonconservation and strength of interaction of elementary particles, 11: 9062(J)
parity violation and general relativity, 11: 6988(J)
parity violation and spin of Λ^0 particle, 11: 10205(J)
particle with mass zero, theoretical consequences, 11: 13557(J)
phase change in nuclear matter, possibility of, 11: 553(J)
phase space calculations, 11: 4192(J)
phenomenological two-nucleon potential up to 150 Mev, 11: 8129(J)
pion coupling constants in nuclear forces, determination, 11: 2049(J)
pion effects on Fermi interactions, 11: 3024(J)
pion-nucleon S waves and K mesons, 11: 12821(J)
pion-nucleon scattering and structure of fourth-order matrix elements in Ps(Ps) meson, 11: 13411(J)
of pion scattering and photoproduction at low energies, 11: 532(J)
probability distribution of number of virtual mesons in nuclei, 11: 6173(J)
real part of complex potential well of the nucleus, 11: 569(J)
recent developments, 11: 1333(J)
relation between Lee model and ordinary meson theory, 11: 10377(J)
renormalizability of pseudoscalar meson theory with pseudovector coupling, 11: 4206(J)
renormalizable field theory, 11: 550(R)
research programs, 11: 6868(R)
resonance levels, characteristic parameters, 11: 4634
reversibility and irreversibility in nuclear resonance, 11: 2028, 2029(J)
review of, on models, structure, forces, and motion, 11: 7297(J)
review of work at Argonne, 11: 6863(R)
saturation of nuclear forces, 11: 5078(J)
scattering matrix insensitivity, 11: 808(J)
spinor fields, commutation relations of interacting, 11: 6178(J)
spin-orbit interaction in nuclear magnetic multipole radiation, 11: 12951(J)
of strange particles, coherence effects in parity doublet, 11: 3626(J)
strong coupling in, 11: 6174(J)
strong interactions in decay processes, 11: 10241(J)
of structure and stability, 11: 8132(J)
surface energy and thickness in the self-consistent model, 11: 2037(J)
time reversal invariance in β decay, possible tests, 11: 6989(J)
unstable particles, method of renormalization, 11: 13434(J)
velocity-dependent nuclear interaction, 11: 6179(J), 10375(J)

Nuclear weapons
See Atomic weapons; Thermonuclear weapons.

Nucleation
See Phase studies.

Nuclei
absorption cross sections for high-energy particles, calculation, 11: 6011(J)

Nuclei (cont'd)

alpha decay fine structure in even-even, 11: 6504(J)

alpha decay of deformed, 11: 13447(J)

alpha decay theory for nonspherical, 11: 2055(J)

alpha disintegration energy, semi-empirical formula, 11: 3536(J)

angular momentum and spatial distribution of nucleons in, 11: 2211(J)

angular momentum coupling in p shell, 11: 4643(J)

antiproton interaction cross sections with, 11: 6550(J)

asymmetric fission of heavy, use of Frenkel's hypothesis to study, 11: 2212(J)

Auger lines for Z = 94, 11: 2027(R)

beta interaction and nuclear levels in, studied by polarization of x-ray quanta from, 11: 5073(J)

bibliography on excited states, isomeric transitions, and systematics of nuclei, 11: 5488

binding energies, effect of P state and higher angular momentum hard-core interaction on, 11: 4626(J)

binding energy of hyper-, 11: 4029(J)

classification of atomic, by nuclear shell model, 11: 2056(J)

collective rotational levels in, 11: 4018(J)

collision with photon, effect on star production, 11: 3992(J)

collisions of nucleons with, hydrodynamical theory of multiple production of particles in, 11: 5695(J)

cross sections for photoproduction of charged π mesons on, with isotopic spin zero, 11: 12837(J)

Coulomb energies, shell effects, 11: 4043(J)

Coulomb excitation, comparison of protons and N ions for, 11: 692(J)

Coulomb excitation and cascade decay of rotational states in odd-mass, 11: 2079(J)

Coulomb excitation by heavy ions, 11: 4061(J)

Coulomb excitation in, induced by N ions, 11: 8142(J)

Coulomb excitation of even-even, angular distribution of γ rays from, 11: 6878(J)

Coulomb excitation of heavy, 11: 7315(J)

Coulomb scattering of relativistic electrons by, 11: 1681(J)

cross sections for charged particles, 11: 4974

decay schemes of oriented, β-γ angular correlation measurements as test of time reversal, 11: 10687(R)

deformability of, connection to shell structure, 11: 4024(J)

deformations of heavy, 11: 4970(J)

density and distribution of orbital angular momentum, 11: 4060(J)

deuteron collisions with heavy, accompanied by deuteron disintegration, 11: 6546(J)

deuteron stripping reactions on heavy, 11: 1347(J)

disintegration in 140 Mev-proton interactions, 11: 9059(J)

disintegrations of light, in nuclear emulsions by slow π^- mesons, 11: 694(J)

distribution of artificial radioactive, among stable, 11: 5501(J)

elastic scattering of 5.4-Mev protons by, 11: 2178(J)

electron excitations and γ transitions in, considered by shape oscillation model, 11: 4618(J)

electron scattering by, at high energies, 11: 6563

electrons and positrons elastically scattered by point, calculations of Mott cross sections, 11: 744(J)

energies of, in which neutrons and protons occupy different unfilled shells, 11: 5549(J)

energy level densities, 11: 12947(J)

energy level lifetimes of, measured by time to pulse height conversion, 11: 2071(J)

Nuclei (cont'd)

energy level repulsion, 11: 4019(J)

energy levels, 11: 9067(J), 10711(J), 11739(R)

energy levels, theory, 11: 12844(J)

energy levels and decay schemes of I^{128}, Sb^{122}, Cr^{48}, I^{128}, Br^{82}, Rb^{82}, K^{42}, Re^{188}, Ca^{47} and Sc^{47}, 11: 1273(R)

energy levels and structure, 11: 9438(J)

energy levels for α-particle and shell models, 11: 580(J)

energy levels in deformed, calculations, 11: 13462(J)

energy levels in neighborhood of IF 7/2 state, 11: 626(J)

energy levels in odd-A, 11: 1542(R)

energy levels of, with odd N, 11: 3532(J)

energy levels with spin 2^+, 11: 5557(J)

energy surfaces of heavy, properties, 11: 4058(J)

energy transfer reactions, theory, 11: 2039(J)

excitation by charged particles, 11: 5497(J)

excitation by electrons, 11: 4963(J)

excitation energy of heavy, calculation method, 11: 804(J)

excitation spectrum at low energies, 11: 3096(J)

excited state measurements, 11: 550(R)

fast neutron inelastic scattering, 11: 591(J)

fission of, energy barrier, 11: 2740

fluctuations of nuclear reaction widths, 11: 1308(J)

formation of compound, 11: 3096(J)

gamma angular distribution from oriented, effect of interactions on, 11: 12859(J)

gamma emission, selection rules for highly deformed spheroidal, 11: 4814(R)

gamma radiation excitation of, 11: 10696(J)

gamma reactions (γ,n) in, near neutron number 50, 11: 3037(J)

gamma transitions in odd mass spheroidal, lifetimes of low-energy El, 11: 6498

independent-particle model of, scattering of electrons studied by, 11: 757(J)

inelastic scattering of electrons by, theory, 11: 10339(J)

inelastic scattering of K^+ mesons in, energy distribution, 11: 10338(J)

inelastic scattering of nucleons by light, theory, 11: 6558(J)

interaction cross sections of neutrons with, 11: 2024(J)

interaction with nucleons, interpretation by statistical model, 11: 6014(J)

interaction with π meson, nuclear properties, 11: 4036(J)

interactions with high-energy particles, 11: 563(J)

interactions with low-energy negative pions, 11: 12826(J)

internal momentum distribution studied by proton scattering, 11: 595

isomeric states, 11: 2094(J)

isomeric transitions of, with odd A, 11: 3531(J)

level spacing, 11: 4023(J)

light, applicability of shell models as approximation for, 11: 7305(J), 7307(J)

light, nuclear photoeffect in, 11: 9086(J)

light, resonance levels in, 11: 4128(J)

low-lying 0^+-states, 11: 7316(J)

magnetic moments, octupole, 11: 13477(J)

magnetic moments of, in many-body problems, 11: 4020(J)

magnetic moments of odd-odd, 11: 581(J)

Nuclei (cont'd)

magnetic resonance signal shape, 11: 6171(J)

masses in Xe–Tl region, 11: 5552(J)

masses of, in S--Tl region calculated from Q-value measurements, 11: 5550(J)

masses of, methods of calculating, 11: 5537(J), 8138

meson absorption cross sections at 4.2 Bev π, 11: 4615(R)

meson absorption cross sections at 4.2 Bev π^-, 11: 4615(R)

meson cross sections, high-energy pi, 11: 13463(J)

meson interactions with k^+, 11: 5470(J)

meson reactions with, γ quantum emission in π, 11: 2167(J)

meson scattering by, according to optical model, 11: 6139(J)

meson scattering by, from 60 to 100 Mev k^+, 11: 5469(J)

meson scattering data for, K^+, 11: 8103(J)

metastable state decay, analyzer for detecting, 11: 5447(J)

mirror asymmetry, 11: 5526(J)

moments of inertia, 11: 8160(J)

neutron absorption in, design of slow neutron velocity spectrometer for studying, 11: 3951

neutron activation cross sections near 25 kev, 11: 9189(R), 11370(J)

neutron and proton binding energies in heavy, variation, 11: 4068(J)

neutron and proton separation energies in, interpretation of regularities in, 11: 6052(J)

neutron capture γ spectra, dependence of shape on odd-even character of compound nucleus, 11: 8541(R)

neutron cross section tables for, over spectra of water moderated reactors, 11: 6508

neutron cross sections, 11: 8137

neutron cross sections of heavy, 11: 590(J)

neutron cross sections of non-fissionable, up to 10 Mev, 11: 591(J)

neutron emission, 11: 8735(R)

neutron energy levels in, low and medium, 11: 11366(J)

neutron interactions with, at 1.0, 1.77, 2.5, 3.25, and 7.0 Mev, 11: 3035(J)

neutron reactions (n,γ), circular polarization of γ radiation from, 11: 5044(J)

neutron reactions (n,p), cross sections, 11: 591(J)

neutron resonances, theory and measurement, 11: 12843

neutron scattering potentials of light, 11: 4016(R)

nonspherical even-even, characteristics of levels, 11: 4063

nucleon distribution in heavy, 11: 624(J)

nucleon inelastic scattering by light, at high energies, 11: 5649(J)

odd, effective cross section for scattering of fast neutrons by, 11: 4010(J)

pairing effect in, 11: 6055(J)

photodisintegration, 11: 3096(J)

photodissociation by 250- to 500-Mev bremsstrahlung, 11: 6115(J)

photon adsorption cross sections, calculated, 11: 10709(J)

photon reactions (γ,β), theory, 11: 11350(J)

photon scattering, 11: 4156(J)

photopion production as a function of atomic weight, 11: 4115

pion interactions with, 11: 3003(J)

pion pair photoproduction in, theory, 11: 5630(J)

pion photoproduction in, 11: 3003(J)

pion production in, by 460-Mev protons and 400-Mev neutrons, 11: 3998(J)

polarization by resonance saturation in paramagnetic crystals, 11: 6026(J)

polarization forces between α clusters in, 11: 6503

Nuclei (cont'd)

polarization in metals, 11: 3004(J), 5528(J)

potential and radius, derivation from diffraction scattering data, 11: 2078(J)

potential well depth, parameter study of, 11: 7712

potential well of, real part, 11: 569(J)

in primary cosmic radiation, time variation of heavy, 11: 405(J)

properties of medium-weight, 11: 5536(J)

proton elastic scattering at 17 and 31.5 Mev from, diffuse-surface optical model analysis, 11: 8209(J)

proton and neutron inelastic scattering by deformed, theory, 11: 7352(J)

proton interaction at 650 Mev, 11: 3528(J)

proton reaction (p,n) cross sections for Cl^{37}, Cr^{53}, Co^{59}, Cu^{65}, Se^{77}, Se^{82}, and Nb^{93}, 11: 9189(R)

proton reaction thresholds for intermediate, 11: 4016(R)

proton reactions at 1 Bev, emission of α particles from, 11: 6932(J)

proton reactions at 140 Mev in heavy, characteristics, 11: 6123(J)

proton reactions (p,p'γ), measurements of strength function from A = 44 to 64, 11: 11376(J)

proton reactions (p,t) and proton scattering by, 11: 13114(R)

proton resonances, 11: 10686(R)

proton scattering by zero spin, 11: 4065(J)

proton strength functions, 11: 11382(J), 11383(J)

protons scattered by complex, calculation of polarization of Bev, 11: 8213(J)

radius, methods of determination, 11: 6505(J)

reactions induced in complex, by 10- to 20-Mev nucleons, 11: 6553(J)

reactions of light, with n,p,d,t, and He^3, cross sections for, 11: 6035

resonance integral estimations, 11: 1618(R)

resonance levels, methods for determination of properties, 11: 12852

resonance neutron capture integrals, 11: 3058(J)

resonance nucleon-nucleus scattering, 11: 2173(J)

rotation phases of atomic, 11: 9460(J)

rotational energy levels in, theory, 11: 6501

rotational states of spheroidal, 11: 3516(J)

scattering of electrons by, 11: 1364(J)

scattering of fast electrons by heavy, 11: 756(J)

scattering of fast electrons by polarized, 11: 8968(J)

scattering of nucleons by, perturbation method for calculating, 11: 5661(J)

scattering of polarized 660 Mev protons by, 11: 12928(J)

scattering of 30-Mev nucleons by, 11: 5656(J)

size of, studied by cosmic-ray interactions, 11: 6058(J)

spallation yields from high-energy proton bombardment of heavy, theory, 11: 3581(J)

spin-orbit coupling in heavy, 11: 13476(J)

spin-orbit interaction in magnetic multipole radiation, 11: 12951(J)

spin-orbit interaction theory, 11: 2040(J)

spin-orbit interaction with nucleons, 11: 4064(J)

spin resonance of, review of theory and experiments, 11: 3009

spin selection rules, charge independence and the comparison of isobaric triplets, 11: 2036(J)

surface deformation, relation to α decay, 11: 5529(J)

surface energy and surface thickness, 11: 1282(J)

surface oscillation of atomic, collective description, 11: 5517(J)

surface rigidity and shell structure, 11: 5520(J)

Nuclei (cont'd)

theory of complex, effect of repulsive core, 11: 4625(J)

theory of semi-transparent, with a diffuse boundary, 11: 591(J)

thermodynamic properties of mixtures of electrons and light, in the field of heavy nucleus, 11: 549

Nuclei (cells)

(See also Cytology; Genetics; Mitochondria; Mitosis; Nucleic acids; Nucleotides.)

morphology, 11: 12642(R)

Nucleic acids

(See also Ribonucleic acid.)

biosynthesis, effects of shock producing chemicals on P incorporation and, in rat sarcoma, 11: 9971(J)

chemical factors, 11: 13565(R)

high-molecular-weight, isolation and properties, 11: 7398(R)

isolation and x-ray diffraction studies on, 11: 1725(R)

metabolism in normal and tumor cells, 11: 1721(J)

properties and isolation of, from tobacco mosaic virus, leukocytes, and yeast, 11: 8258(R)

radiation chemistry, 11: 960(J)

radioinduced changes in rabbit appendix and thymus, tracer study, 11: 9921(J)

radioinduced changes in spleen content, 11: 2780, 2791(J)

radiosensitivity of molecular weight in tobacco mosaic virus, 11: 5241(J)

separation and purification of, from yeast, 11: 2233(R)

separation from yeast, 11: 10803(R)

synthesis, effects of x radiation in rat liver, 11: 10400(J)

synthesis in tumors, effects of irradiation in mice, tracer study, 11: 3653(J), 3654(J), 3655(J), 3665(J)

Nucleons

(See also Neutrons; Protons.)

angular momentum and spatial distribution in nuclei, effect of density distribution, 11: 2211

annihilation cross sections, 11: 13483(J)

annihilation of nucleon-antinucleon system into K-anti-K pair, 11: 565, 9058(J)

anomalous magnetic moments, contributions of heavy unstable particles to, 11: 4025(J)

antinucleon scattering cross sections, 11: 587(J)

collisions with nuclei, hydrodynamical theory of multiple production of particles in, 11: 5695(J)

collisions with nucleons, multiple particle production in, 11: 12190(J)

collisions with nucleons, pion production in, 11: 5689(J)

collisions with pions, pion production in, 11: 5691(J)

conservation, 11: 1629(J), 6978(J)

coupling constants between two, with pion theoretical potential, 11: 4199(J), 4200(J)

densities in diffuse-boundary independent-particle model, 11: 3019(J)

diffraction scattering in collisions with π mesons, 11: 3997(J)

distribution in heavy nuclei, 11: 624(J)

effective mass of, in nuclei, 11: 1623(J)

electromagnetic properties, theory, 11: 6977(J)

electromagnetic structure, 11: 5522(J)

inelastic scattering by light nuclei, theory, 11: 6558(J)

inelastic scattering by surface interaction, 11: 1368(J)

inelastic scattering of high-energy, by light nuclei, 11: 5649(J)

Nucleons (cont'd)

interaction potential between the Λ^0 hyperon and, 11: 568(J), 10671(J)

interaction potential for 2-nucleon system in nuclear saturation theory, 11: 12947(J)

interaction with antinucleons, potential, 11: 2213(J)

interaction with nuclei, interpretation by statistical model, 11: 6014(J)

interaction with pseudoscaler meson field, energy, charge, spin, ground, and isobar states, 11: 2206(J)

interactions of P- and S-wave pions with fixed, 11: 3025(J)

interactions with high-energy particles, 11: 563(J)

interactions with hyperons, study from K-meson capture in H and D, 11: 3995(J)

interactions with mesons, nucleons, electrons, and photons, conferences on, 11: 6506(J)

interactions with mesons, symmetry operations of Hilbert space and selection rules, 11: 12164(J)

interactions with K mesons, 11: 5470(J), 5484(J), 10340(J)

interactions with μ mesons, 11: 12163(J)

interactions with nucleons, review, 11: 2034(J)

interactions with nucleons at high energies, predictions of Levy potential, 11: 5687(J)

interactions with pions, model for, 11: 5509(J)

magnetic moment, effect of cut-off limit of meson momentum on, 11: 1386(J)

meson coupling constant, classical calculation, 11: 9057(J)

meson field non-linear equations with self-action in third order, 11: 2030(J)

meson production by collisions with mesons, Heisenberg representation, 11: 10202(J)

meson scattering by, dispersion relations, 11: 4731(J), 10219(J)

meson scattering by, in low-energy region, 11: 7283(J)

meson (K^+) scattering by, in perturbation theory, 11: 6138(J), 6869

meson scattering by, Tamm-Dancoff theory, 11: 5657(J)

meson scattering by, theory, 11: 528(J), 3980(J), 5651(J)

meson scattering by fixed, causality and dispersion relations for, 11: 3594(J)

model of the strong coupling, 11: 10217(J)

momentum in various nuclei from high-energy photoeffect, 11: 3021(J)

motion in rotating well and nuclear moments of inertia, 11: 572(J)

nuclear reactions induced by 10- to 20-Mev, analysis, 11: 6553(J)

nucleon scattering, dispersion relation, 11: 4148(J)

phase-shift fits of scattering data, 11: 2041(J)

photon scattering, 11: 4156(J)

photon scattering by, calculation of cross section, 11: 4157(J)

photoproduction of mesons from, transition amplitudes for, 11: 12825(J)

pion coupling constants and phase shifts, 11: 2007(J)

pion interaction coupling constants, determination from scattering experiments using dispersion relations, 11: 9036(J)

pion interactions with, non-local models, 11: 7301(J)

pion photoproduction in, 11: 3003(J)

pion production in collisions of nucleons with, isobaric nucleon model for, 11: 5991(J)

pion scattering, comparison of spin-flip dispersion relations, 11: 2042(J)

pion scattering by, dispersion relations for finite momentum transfer, 11: 749(J)

pion scattering by, effect of nucleon recoil, 11: 3628(J)

Nucleons (cont'd)
pion scattering by, evaluation of scattering lengths, 11: 1678(J)
polarization of, from photodisintegration of D, 11: 5621(J)
polarization of fast, review, 11: 5496(J)
polarization of high-energy, exciting a collective level, 11: 6500
polarization of high-energy, scattered by carbon, 11: 6956(J)
potential, binding, kinetic, and total energies, effect of parameters of nonuniform density distribution, 11: 4202(J)
potential between two, phenomenological, 11: 8129(J)
resonance nucleon-nucleus scattering, 11: 2173(J)
scattering, dispersion relation for nucleon–nucleon, 11: 4148(J), 13533(J)
scattering, phase-shift studies, 11: 2041(J)
scattering by antinucleons, theory, 11: 4193(J)
scattering by complex nuclei, low energy elastic, 11: 13538(J)
scattering by mesons, quantum field theory equations, 11: 2214(J)
scattering by mesons, relativistic theory, 11: 6564(J)
scattering by nuclei, optical model for elastic, 11: 3096(J)
scattering by nuclei, perturbation method for calculating, 11: 5661(J)
scattering by nuclei in 30-Mev region, 11: 5656(J)
scattering by nucleons, calculations, 11: 748(J)
scattering by nucleons, cross sections, 11: 588(J)
scattering by nucleons, dispersion relations for, 11: 13533(J)
scattering by nucleons, generalized effective range theory, 11: 13537(J)
scattering by nucleons and mesons, solutions of Bethe-Salpeter equation, 11: 1688(J)
scattering by pions, nuclear magnetic moments contribution to radiative, 11: 9061(J)
scattering matrix construction, 11: 8208(J)
scattering model for inelastic, 11: 13542(J)
scattering of K mesons by, 11: 2163, 4616, 12818(J)
scattering of Σ hyperons by, cross sections, 11: 6845(J)
scattering theory, meson-nucleon, 11: 5651(J), 5657(J)
scattering theory, nucleon-nucleon, 11: 748(J), 3003(J), 4193(J)
scattering theory for nucleon-nucleon, generalized effective range, 11: 13537(J)
scattering theory of inelastic, 11: 13539(J)
self-energy, calculations, 11: 5493(R)
single spinless nonrelativistic, in presence of neutral scalar meson field, 11: 1633(J)
spin-orbit interaction with nuclei, 11: 4064(J)
structure, 11: 6874(J)
symmetry between Ξ particle and, expressed by use of vectorial charge displacement, 11: 12165(J)
theory of p-wave interaction with pions, 11: 5074(J)
translational motion, meson-field mass, and magnetic moment, 11: 4207(J)
Nucleoproteins
radiation effects on, isolated from mouse spleen, 11: 8766
Nucleotides
(See also Nucleic acids.)
chromatographic analysis, 11: 11087
identification, 11: 830(R)
radioinduced changes in rabbit appendix and thymus, tracer study, 11: 9921(J)
Nuts
See Bolts and nuts; Seed.
Nylon
See Plastics.

O

Oak Ridge National Lab., Tenn.
accident report on radiation incident of Feb. 1, 1956, 11: 7812
environs monitoring, 11: 8705(R), 13597(R)
progress reports, 11: 9814(R), 10946(R), 12319(R), 12321(R), 12330(R), 12965(R), 12993(R)
progress reports on amine extraction, 11: 3362(R)
progress reports on analytical chemistry, 11: 8285(R), 8296(R), 11586(R), 12973(R)
progress reports on applied nuclear physics, 11: 1618(R)
progress reports on boron isotope separation, 11: 11577(R)
progress reports on chemical development, 11: 12966(R), 13648(R), 13649(R), 13650(R), 13651(R), 13653(R), 13654(R), 13656(R), 13658(R), 13662(R)
progress reports on chemical separation of isotopes, 11: 8557(R), 9664(R), 12513(R), 13637(R)
progress reports on chemical technology, 11: 7139(R), 7417(R), 7481(R), 7500(R), 7507(R), 13017(R), 13597(R), 13638(R)
progress reports on chemistry, 11: 7430(R), 8282(R), 8283(R), 8284(R), 8286(R), 8288(R), 9587(R), 11574(R), 11576(R), 12339(R), 12970(R), 13652(R), 13659(R), 13660(R), 13661(R)
progress reports on continuous dissolving, 11: 11608(R)
progress reports on corrosion, 11: 3809(R), 6348(R), 11682(R), 12027(R), 12465(R)
progress reports on Dapex Process, 11: 3361(R)
progress reports on decontamination of HRE Loop, 11: 7775(R)
progress reports on denitration of uranyl nitrate, 11: 12416(R)
progress reports on diaphragm feed pump development, 11: 2894(R)
progress reports on electromagnetic separation, 11: 13836(R), 13864(R)
progress reports on engineering, 11: 979(R), 980(R), 4361(R)
progress reports on electronuclear research, 11: 13114(R)
progress reports on feed materials, 11: 7511(R), 7514(R), 8359(R), 8411(R), 10836(R)
progress reports on fission product separation, 11: 9255(R)
progress reports on health physics, 11: 52(R), 10805(R)
progress reports on high pressure recombination loops, 11: 4089(R)
progress reports on homogeneous reactor chemical processing, 11: 9617(R), 13639(R)
progress reports on Homogeneous Reactor Experiment, 11: 11801(R)
progress reports on Homogeneous Reactor Test, 11: 9826(R), 10947(R)
progress reports on homogeneous reactors, 11: 4692(R), 6536(R) 7857(R), 7861(R), 8706(R), 8707(R), 8708(R), 9804(R), 9863(R), 9869(R), 12584(R), 12585(R), 12898(R), 13982(R), 13985(R)
progress reports on instrumentation, 11: 4544(R)
progress reports on ion exchange studies, 11: 8338(R)
progress reports on isolation of U^{233}, 11: 8341(R)
progress reports on laboratory development of the Thorex Process, 11: 13019(R)
progress reports on materials chemistry, 11: 2355(R), 2363(R), 11647(R)
progress reports on mathematics, 11: 8561(R), 9387(R), 13851(R)
progress reports on metal recovery, 11: 8343(R)
progress reports on metallurgy, 11: 12456(R)
progress reports on ORNL Research Reactor, 11: 8634(R), 9794(R) 10952(R)
progress reports on physics, 11: 4016(R), 8548(R), 9189(R), 14031(R)
progress reports on Pu extraction, 11: 7485(R)

Oak Ridge National Lab., Tenn. (cont'd)
progress reports on power reactor fuel processing, 11: 7509(R), 7513(R), 10820(R), 13682(R)
progress reports on process testing, 11: 186(R), 1823(R), 1824(R), 2859(R), 2860(R), 3359(R), 5262(R)
progress reports on pulse generator development, 11: 7451(R)
progress reports on radiation damage to TBP and diluents, 11: 7130(R)
progress reports on radioactive waste disposal, 11: 12006(R)
progress reports on radioisotope production, 11: 9987(R)
progress reports on RaLa Process development, 11: 11607(R)
progress reports on raw materials, 11: 7090(R), 8869(R), 10036(R), 10475(R)
progress reports on reactor technology, 11: 8705(R)
progress reports on solid state physics, 11: 1922(R), 8747(R)
progress reports on solvent extraction, 11: 2329(R), 8340(R)
progress reports on stable isotopes, 11: 3935(R)
progress reports on statistical quality control, 11: 10815(R)
progress reports on Thorex Process, 11: 8357(R), 8395(R), 8396(R) 11606(R), 13640(R)
progress reports on Thorium Breeder Reactor, 11: 8618(R)
progress reports on Th dissolving, 11: 7484(R)
progress reports on ThO_2 slurry development, 11: 7414(R)
progress reports on 25 Process assistance, 11: 7503(R), 7504(R), 8352(R)
progress reports on 23 Process, 11: 12989(R)
progress reports on unit operations, 11: 11053(R), 11567(R), 13644(R)
progress reports on U chemistry of raw materials, 11: 11655(R)
research programs in reactor physics, 11: 11555(R)

Oak Ridge National Lab., Y-12 Area, Tenn.
progress reports on chemical research, 11: 11578(R)
progress reports on electromagnetic research, 11: 9888(R)

Oak Ridge Operations Office, AEC
information meeting on cold processing of enriched U, September, 1956, 11: 215

Ocean water
See Sea water.

Off-gases
See Stack disposal; Waste processing.

Ohio State Univ. Research Foundation, Columbus
progress reports on phase studies in ternary metal–metal–O_2 systems, 11: 5871(R)

Oil shales
(See also Black shales; Carbonaceous shales.)
acid leaching, 11: 2404
recovery of U from, by leaching, 11: 12410(R)

Oils
(See also Greases; Lubricants; Vacuum systems.)
anticorrosion admixtures to, tracer study of action mechanism, 11: 279(J)
chromatographic separation and infrared spectra of irradiated, 11: 964
decomposition by radiation, 11: 8738
determination in CO_2, 11: 8840
heat transfer in, and shot-oil mixtures, 11: 10862
infrared absorption determination of trace amounts in CO_2, 11: 5216
radiation effects, 11: 7885
recovery from shales, 11: 2311(R), 2313(R), 2314

Oils (cont'd)
transformer, as coolant compared to kerosene for canned rotor motor, 11: 2454

Ointments
See Protective ointments.

Olefins
See Alkenes.

Oleic acid
labeled with C^{14}, synthesis, 11: 8258(R), 12961(R)
metabolism in mice, tracer study, 11: 12961(R)

OMRE
See Organic Moderated Reactor Experiment.

Oogenesis
radiosensitivity, 11: 13240(J)

Optical materials
gamma radiation effects, 11: 6149
with high transparency to infrared, survey, 11: 2197
radiation effects, 11: 11566(R)

Optical nuclear models
See Nuclear models (optical).

Optical systems
(See also Infrared optical systems; Remote-viewing equipment.)
analysis of bubble chamber photographs simplified by, 11: 1565
design of Schlieren, 11: 4412(R)
for measuring cloud chamber tracks, 11: 1604(J)
recording, photometric particle-size analyzer, developed, 11: 1562
reticle-projecting microscopes, 11: 10153(J)

Oral epithelium
See Epithelium.

Oralloy
See Uranium isotopes.

Orange Cliffs Quadrangle (Utah)
photogeologic map, 11: 1095(J), 1104(J)

Orange oxide
See Uranium(VI) oxides.

Orderville Canyon Quadrangle (Utah)
photogeologic map, 11: 1105(J)

Ordnance materiel
mechanical shock resistance and temperature effects to –65°F, 11: 336

Ore processing plants
See Uranium ore processing plants.

Oregon
uranium occurrence in black shale deposits of, 11: 3409(J)

Ores
(See also specific ores, e.g., Thorium ores; Uranium ores.)
comminution, energy size relationships in, 11: 6237(R)
particle sorting by degree of radioactivity, 11: 5100(P)
separation by flotation, 11: 6690(J)
uranium recovery by solvent extraction, 11: 10038(J)

Organic acids
determination in process solutions, 11: 8291
precipitates with Th, thermal decomposition, 11: 6240(J)
radiation chemistry, 11: 960(J)

Organic chemistry
(See also Biochemistry; Radiochemistry; Reaction mechanisms.)

Organic chemistry (cont'd)
ion exchange in, book, 11: 11127(J)
use of isotopes in, 11: 6451(J)
Organic compounds
(Specific organic compounds are indexed according to precedents found in such standard reference works as Chemical Abstracts, Handbook of Chemistry and Physics, Biological Abstracts, etc.)
adhesion to metal substrates, 11: 5302
analysis for H^3 and C^{14} in the same sample of labeled, 11: 9008(J)
analyses for O_2, 11: 11934(J)
backscattering of beta particles in, 11: 8206(J)
cooling and moderating properties, bibliographies, 11: 3558, 4655
corrosion inhibition by, 11: 5308
electrodeposition of metals from solutions, 11: 1898(J)
electron and gamma radiation effects, 11: 13284
explosibility of diphenyl dust and Santowax R powder, 11: 3558
fluorescence efficiencies, measurement, 11: 7099(J)
fluorescence of, quenching effects of CCl_4, 11: 1179(R)
fluorescence of liquid systems, energy transfer mechanisms, 11: 1178(R)
fluorescence of solutions in solid plastics, 11: 4488
heat transfer and corrosive effects, 11: 2889
heat transfer in single tube, natural-circulation, vertical-tube boiler, 11: 6707(J)
heat transfer properties, 11: 5298, 6087(R)
lubricity, 11: 9211(R)
lubricity of aromatic, 11: 6710(R)
luminescence, radiation effects, 11: 31(J)
as moderators and coolants in nuclear reactors, 11: 12905(J)
molecular structure of spiranes and other rigid molecules, 11: 12687
oxygen^{18} concentration in the oxygen of, 11: 1448
proton magnetic resonance in, 11: 9070(J)
quenching of liquid-scintillator solutions by, 11: 3964(J)
radiation chemistry, 11: 960(J)
radiation effects, 11: 11566(R)
radiation effects and production by radiation, 11: 8858(J)
radiation effects and properties of, compilation of data on, 11: 3558
radiation effects on lubricants and gasoline, 11: 7961, 12984, 12985
radiation effects on optical properties, 11: 1805
scintillation properties, 11: 6505(J)
synthesis of, containing C^{14}, 11: 3330(R), 7430(R), 7977, 8283(R), 11132, 11574(R), 12330(R), 12339(R)
thermal stability, 11: 13868(R)
Organic compounds, metallo-
preparation and properties, 11: 1765(R), 3369, 11057(R)
Organic cooled reactors
engineering data, 11: 6922(J)
Organic leach solutions
See Uranium leach solutions (organic).
Organic Moderated Reactor Experiment
design, construction, and economics of, forum on, 11: 5028
design studies and components, progress, 11: 6087(R)
fuel element development, 11: 12895(R)
Organic moderated reactors
advantages for exporting, 11: 1660(J)
Organic moderated reactors (cont'd)
coolant burnout studies of polyphenyl, 11: 12891(R)
coolants, radiation stability, 11: 7429(R)
design, 11: 7724
design and development, 11: 12895(R)
design criteria and programs for, 11: 2775(J)
design for merchant vessels, 11: 12901
development, 11: 12239(R), 12240(R)
economic evaluation of homogeneous power production, 11: 12549
heat transfer properties of organic compounds, 11: 2889
maintenance, 11: 10280
nuclear design study of, using biphenyl as moderator and coolant, 11: 7724
organic compounds for moderators and coolants in, 11: 12905(J)
Organic solvents
See Solvents.
Organisms
(See also Microörganisms.)
radioinduced effects in genetics and mutations, 11: 10405(J)
Organs
radioinduced changes, 11: 7056(J)
radiosulfur S^{35} deposition in, and organs of human adults and young and adult rats, 11: 9978(J)
Orientation
See Preferred orientation.
ORNL Graphite Reactor
design and operation, 11: 591(J), 1327, 5035(J)
experimental facilities, 11: 13628
fast neutron flux distribution in, Monte Carlo calculation, 11: 9868
fuel slug canning procedure, testing, and operating experience, 11: 7766
operation in 1955, 11: 7860
power level increases in, optimum loading for, 11: 7818
proposal to reload with enriched U, 11: 8651
shielding, radiation dose rate as a function of thickness, 11: 1618(R)
slug element rupture in, 11: 7749, 7855
ORNL reactors
See Bulk Shielding Facility; Homogeneous Reactor Experiment; Homogeneous Reactor Test; Intermediate Scale Homogeneous Reactor; Materials Testing Reactor Mockup; ORNL Graphite Reactor; ORNL Research Reactor; Thorium Breeder Reactor; Tower Shielding Facility.
ORNL Research Reactor
beam holes, effects of reflector on flux in, 11: 1618(R)
cooler for removing γ heat from loop core walls, 11: 3066
cooling requirements, 11: 7777
design, 11: 4098
design, safety, and waste disposal, 11: 9867
design and construction, 11: 8634(R), 9794(R), 10946(R), 10952(R)
fuel elements, hydraulic testing, 11: 10935
fuel elements, safety rods and reflector, hydrodynamic thermal characteristics, 11: 2662
instrumentation, 11: 10949
instrumentation and control, 11: 13382(J)
ionization chambers for use in, heat removal from shielding for, 11: 8749
neutron flux and γ heating in in-pile loop, 11: 11776

ORNL Research Reactor (cont'd)
neutron flux distribution calculation, infinite slab model, 11: 10928
permissible fuel concentration in the dump tanks of, 11: 11775
shim rod reaction time, 11: 2644
stress and temperature distribution in, cylindrical concrete shield, 11: 2763
temperatures in tank near poolside facility, 11: 8638
thermal stresses in the Al components of the tank and facility liners, effect of energy absorption, 11: 2666
Oscillators
(See also Microwave oscillators; Oscillographs; Pulse generators (electronics); Radiofrequency oscillators; Reactor oscillators.)
automatic tuning control for, 11: 2743
design of, for magnetic field measurement and stabilization, 11: 454
design of transistor-type, for secondary frequency standard, 11: 11542(P)
design with constant frequency a-c output, 11: 3253(P)
projected resonant traveling wave tube for power, 11: 1383(R)
space charge effects in beam-type magnetron, theory, 11: 7246(J)
synchronization by radio pulses, 11: 6445(J)
valve and circuit arrangement, effect on generating stabilized high voltage direct current, 11: 3640(P)
Oscillographs
recording of fast high-voltage phenomena, measuring booth for, 11: 12115(J)
time reference marker for simultaneous use with several, 11: 8070
Osmium
anion exchange separation from Ir^{191m}, 11: 1002(J)
coulomb excitation, 11: 12125(J)
electrode potentials of OsO_2-OsO_4 couple, 11: 1079(J)
ion exchange from chloride solutions, 11: 9587(R)
neutron total cross sections and resonance parameters, 11: 9078(J)
nitrogen ion beam (N^{14}) reactions, 11: 2076(J)
sigma phases containing, 11: 11238(J)
thermal-neutron coherent scattering amplitudes, 11: 4050(J)
Osmium isotopes Os^{185}
decay schemes, 11: 9162(R), 12862(J)
Osmium isotopes Os^{186}
energy levels, mixing ratios of $2+ \rightarrow 2+$ transitions, 11: 12203(J)
Osmium isotopes Os^{188}
energy levels, 11: 1646(J), 12125(J)
Osmium isotopes Os^{189}
quadrupole moments, 11: 4646(J)
Osmium isotopes Os^{190}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)
energy levels, 11: 12125(J)
Osmium isotopes Os^{191}
low-energy quanta from, coincidence arrangement for detection, 11: 1595(J)
Osmium isotopes Os^{192}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)
energy levels, 11: 12125(J)
energy levels studied by radioactivity of Ir^{192}, 11: 6050(J)
Osmium oxides
electrode potentials of OsO_2-OsO_4 couple, 11: 1079(J)
Osmium oxides (cont'd)
infrared spectrum, 11: 2873(J)
passive potential with electrolytic iron, 11: 1519
Osmium–uranium alloys
thermal analysis, 11: 13042
Ovaries
See Gonads.
Ovens
(See also Furnaces.)
design and operation of high temperature electric, 11: 11102
Oxalate complexes
(See also Thorium oxalate complexes.)
absorption spectra, 11: 2874(J)
separation by ion exchange on Dowex-A1, 11: 11586(R)
Oxalates
absorption spectra, 11: 2874(J)
Oxalic acid
absorption spectra, 11: 2874(J)
corrosive effects on 304-L and 347 stainless steel, 11: 3811
decomposition by H_2SO_4, 11: 2254
dihydrate, crystal structure, 11: 9587(R)
Oxazoles
synthesis, 11: 3325(R)
Oxazoles, 2,5-diaryl-
scintillator gel, 11: 503(J)
Oxazolones
pharmacological effects, 11: 13566(R)
pharmacological effects in mice, 11: 9576(R)
Oxidases
(See also Peroxidases.)
d-amino acid, inactivation, 11: 9215(J)
Oxidation
(See also Oxidizing agents.)
anodic, of Zr alloys, mathematical analysis, 11: 5859
of metals and alloys, review, 11: 5358(J)
Oxide coatings
electrophoretic deposition, use of zein in, 11: 11572(R)
preparation, 11: 13093(R)
Oxide crucibles
purification of nuclear fuels by melting in, 11: 10841
Oxide films
electrical properties of thin, measured by gaseous discharge plasma method, 11: 7214(J)
formation on metals subjected to increasing temperature, mathematical analysis, 11: 1076
structure on Cr–Ni steels, x-ray-diffraction analysis, 11: 281(J)
Oxide filters
effectiveness of MnO_2 for clarifying 25 Process solutions, 11: 9656
Oxide powders
drying for neutron transmission measurements, 11: 5329
Oxide foils
(See also Thorium oxide foils.)

Oxide slurries
for stripping loaded amine solvent, 11: 3758(R)

Oxides
(See also the oxides of specific elements.)
coloration and luminescence, 11: 5376(J)
decomposition by fusion with borax, 11: 4441(J)
determination of active surface values of dust, (Mn, Al, Fe, and Si), 11: 3473(J)
determination of standard molar free energy of formation of metal, 11: 6235
diffusion of metals into, bibliography, 11: 3832(R)
infrared spectra of inorganic, 11: 12711(J)
surface tension of various FeO systems at 1300 to 1400°C, 11: 1069(J)
thermoluminescence, 11: 7220(J)

Oxidizing agents
effectiveness in carbonate leaching of U ores, 11: 11980

Oximes
bibliography of diaminoethanedionedioxime, 11: 2813

Oxine
See 8-Quinolinol.

Oxygen
(See also Ozone.)
adsorption on Co, Cu, and Ni, 11: 11918
antiproton interactions with nuclei, 11: 11362
catalytic and corrosion inhibitive effects in HRT fuel solution, 11: 13910
catalytic recombination with H_2, 11: 12585(R)
catalytic reduction of radiolytic, on ThO_2 slurries, 11: 4265
combustion determination in Cr, Ti, V, Zr, and steels, 11: 921
continuous detection and measurement in gases, design, and performance of instrument for, 11: 2271
control in Na heat-transfer systems, 11: 249(J)
corrosion inhibition, 11: 13985(R)
cryogenic data, 11: 386
determination in organic compounds, 11: 11934(J)
determination in Pu, U, and Zr, 11: 3339
determination in Na, 11: 13564(R)
determination in Na and NaK, 11: 8290
determination in Ti and Ti alloys, 11: 6259, 11086, 12674
determination in U and Th, 11: 13578(R)
determination in U and UH_3, 11: 12349
determination in Zr and Zircaloy, 11: 11587
determination of U/O atomic ratio in uranium oxides, 11: 105
detonation velocities in C_2N_2 mixtures, 11: 6645(J)
diffusion in UO_2 and reaction with UO_2, 11: 12000(R)
diffusion in Zr and Zr alloys, 11: 10090
diffusion into β titanium, 11: 4472
diffusion rates in Nb alloys, 11: 6366
effect of O content on the corrosive effects of reactor coolants, 11: 2487
effect on radiolysis of alkyl iodides, 11: 7962(J)
effects on mechanical properties of Zr, 11: 3419
effects on radiosensitivity, 11: 861(J), 883(J), 5173(J)
electron scattering by, at low energies, 11: 5654(J)
energy levels, electron excitation of 3p, 11: 7317(J)
enthalpy and humidity of D_2O-saturated solutions, 11: 2284

Oxygen (cont'd)
evolution in homogeneous reactors, 11: 963
gamma absorption cross sections, 11: 12287(J)
gamma reactions (γ,p), 11: 700(J), 6126(J)
heat of adsorption on UO_2 at −183°C, 11: 10052(J)
isotope cycle in nature, 11: 8001(J)
isotopic dilution determination in Ti, 11: 5792(J)
isotopic standards for, 11: 10159(J)
meson(π^-) interactions at 140 to 400 Mev, total cross section for, 11: 12830(J)
neutron capture cross sections, 11: 1618(R)
neutron cross sections, 11: 9777, 11739(R), 12284
neutron elastic scattering cross sections, 11: 2174(J), 4016(R)
nucleon momentum in, from high-energy photoeffect, 11: 3021(J)
photoproton angular distribution, 11: 9085(J)
production from radiolysis of H_2O in HRT heat exchangers, 11: 8608
protons scattered at 96 Mev by, energy spectrum, 11: 612(J)
radiation chemistry, mechanisms of, 11: 11953(J)
radiosensitivity effects, 11: 11890(J), 11891(J)
reaction with $Pu_2(SO_4)_3$, effect of D_2O on rate, 11: 5281(J)
reaction with Na, effect on reactor housings, 11: 670(J)
reactions with CoS, CuS, NiS, and ZnS at elevated temperatures, 11: 1766(J)
reactions with Pu^{3+} in H_2SO_4 solutions, 11: 1015(J)
reactions with PuF_4 above 700°C, 11: 4385
reactions with water, radiation effects, 11: 7406(R)
recombination with H_2, ionic catalysts for, 11: 13584
recombination with H_2 and D_2 in a high pressure loop, 11: 4089(R)
role in photosynthesis, 11: 12661
solubility in biphenyl, isopropyl- at atmospheric pressure and temperatures to 125°C, 11: 5406
solubility in liquid Na, 11: 11060
solubility in H_2O and UO_2SO_4 solutions at 212 to 325°F, 11: 1017
spectrographic determination in steel, 11: 11091(J)
spectrographic methods of quantitative analysis for low concentrations, 11: 2259
uranium oxidation in $HClO_4$ solutions by, 11: 217(J)
vacuum fusion determination in La, 11: 3706(J)
vacuum fusion determination in metals, 11: 4826
vacuum fusion determination in metals and B and Si, 11: 4308(J)
vacuum-fusion determination in Ti, 11: 116(J)
wave functions, 11: 4490(R)

Oxygen (liquid)
cryogenic data, 11: 386
π-meson photoproduction cross section in, 11: 6484(J)
preparation, explosion prevention by C_2H_2 removal, 11: 5257(J)

Oxygen–aluminum–titanium systems
See Aluminum–oxygen–titanium systems

Oxygen–beryllium systems
See Beryllium–oxygen systems

Oxygen–carbon dioxide–hydrogen systems
See Carbon dioxide–hydrogen–oxygen systems

Oxygen–formic acid systems
See Formic acid–oxygen systems

Oxygen–hydrogen systems
See Hydrogen–oxygen systems

Oxygen–hydrogen–water systems
See Hydrogen–oxygen–water systems

Oxygen ions
linear energy transfer in tissue, 11: 4245(J)
thermodynamic properties, calculation of ideal-gas, 11: 12788

Oxygen–iron–nickel systems
See Iron–nickel–oxygen systems

Oxygen isotopes
abundance, upper limits, 11: 8983(J)
application to study of reactions in homogeneous solutions, 11: 5197(J)
determination in organic compounds, 11: 127(J)
determination of, in water, 11: 9238(J)
effects on analysis of Pu isotopes using PuO_2 ion beams, 11: 5773
fractionation, effects on oxidation of Cu, 11: 10046(J)
nuclear properties calculated by independent-particle, central field model, 11: 6175(J)
separation by fractionation of complexes containing, 11: 11534(P)

Oxygen isotopes O^{15}
angular momentum of 8.34-Mev level in, 11: 10758(J)
beta decay, 11: 7292(R)
half life, 11: 4747(J)
positron spectrum, 11: 4995(J), 10232(R)

Oxygen isotopes O^{16}
bremsstrahlung reactions (γ,4α), 11: 686(J)
deuteron reactions, 11: 1542(R), 2088(J), 2145(J), 3092(J), 3195(J), 4988(J)
deuteron reactions (d,n), energy spectrum of neutrons from, 11: 6838(J)
deuteron reactions (d,p), (d,α), and (d,d) in energy range 3.4 to 4.2 Mev, 11: 10766(J)
energy levels, 11: 1274(R), 1300(J), 4712(J), 5000(J), 10325(J)
energy levels at 10.98 Mev, 11: 10687(R)
energy levels, first excited O^+ state, 11: 9071(J)
energy levels studied by proton bombardment of N^{15}, 11: 7292(R)
excited states at 6.91 and 7.12 Mev, lifetimes, 11: 6866(R)
formation by α capture in core of stars, 11: 3889(J)
gamma reactions (γ,4α), mechanism, 11: 12271(J)
gamma reactions (γ,n), cross section for, 11: 11450(J), 11451(J)
gamma reactions (γ,p) at 30, 35, and 70 Mev, 11: 690(J)
ground state energies for α-particle and shell models, 11: 580(J)
neutron reactions, 11: 591(J), 3086(J), 4707
neutron reactions (n,α), cross sections, 11: 13519(J)
nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)
photodisintegration, α particle model, 11: 12275(J)
photodisintegration, scintillation spectrometer study, 11: 6552
products from copper^{63} reactions, 11: 4123(J)
proton scattering angular distribution for, 11: 5058(J)
states below 12 Mev which decay by γ emission, 11: 10232(R)

Oxygen isotopes O^{17}
collective effects, 11: 13465(J)
cost of production of 10% purity by chemical exchange, 11: 4925
energy levels, 11: 3086(J), 4988(J), 6117
hyperfine structure and nuclear electric quadrupole moment, 11: 13469(J)

Oxygen isotopes O^{17} (cont'd)
neutron reactions (n,p) in, in water, 11: 4707
phase shifts, 11: 9189(R)
proton reactions, 11: 2146(J), 6145(J)
quadrupole coupling constant in $C^{12}O^{17}$ and quadrupole moments, 11: 4489(R)
quadrupole moment, 11: 11380(J), 12177(R)
relaxation by paramagnetic ions, and chemical shifts, 11: 4814(R)
separation, chemical methods for, 11: 12513(R)
spin orbit forces, 11: 1638

Oxygen isotopes O^{18}
alpha reactions (α,2p), 11: 3085(J)
determination of concentration in oxygen of organic compounds, 11: 1448
deuteron reactions, 11: 6109(J), 6112(J)
diffusion in H_2O–D_2O, mechanism, 11: 8985(J)
energy levels in, studied by F^{19}(t,α)O^{18} reaction, 11: 3055(J)
energy levels studied in reaction F^{19}(n,d)O^{18}, 11: 8156(J)
isotopic exchange in mineral oxides with CO_2 and determination of active surface values of dust oxides (Mn, Al, Fe, and Si), 11: 3473(J)
isotopic exchange reactions between H_2O and other substances, 11: 1568(J)
proton reactions (p,α) and (p,n), 11: 705(J), 4708(J)
tracer techniques (chemistry), 11: 1013

Oxygen isotopes O^{19}
spin and parity of first excited state, 11: 3538(J)

Oxygen isotopes O^{20}
half life, 11: 11310(J)
preparation by O^{18}(α,2p) reaction, 11: 3085(J)

Oxygen–lead systems
See Lead–oxygen systems

Oxygen–nitrogen systems
See Nitrogen–oxygen systems

Oxygen–silicon–titanium systems
molecular rearrangement, bond strength and infrared spectra, 11: 73

Oxygen–sodium systems
phase studies, 11: 11060

Oxygen–tin–zirconium systems
fatigue notch sensitivity, 11: 2527

Oxygen–titanium systems
(See also Titanium oxides.)
electrode potential of, apparatus for measuring, 11: 12674
phase studies, 11: 4468, 5892
thermodynamic properties, 11: 13335
thermodynamic properties determined by mass spectrometric study, 11: 2919

Oxygen–titanium–zirconium systems
phase studies and x-ray-diffraction analysis, 11: 259, 5871(R)

Oxygen–uranium systems
(See also Uranium oxides.)
thermodynamics, 11: 4214
x-ray-diffraction analysis, 11: 8269(R)

Oxygen–vanadium systems

(See also Vanadium oxides.)

thermodynamic properties determined by mass spectrometric study, 11: 2919

Oxygen–water systems

corrosive effects, 11: 1864

radiation chemistry, 11: 9579(R)

thermodynamic properties, 11: 904

Oxygen–water–d_2 systems

enthalpy and humidity, 11: 2284

Oxygen–zirconium systems

(See also Zirconium oxides.)

fatigue notch sensitivity, 11: 2527

low-pressure solubility and diffusion of H in, 11: 5909(J)

Ozone

production by irradiation of air, 11: 2301

reaction rate with CO, 11: 9248(J)

toxicity, 11: 985

P

P-10

See Ethylene, chlorotrifluoro- polymers.

Package power reactors

(See also Army Package Power Reactor.)

advantages for exporting, 11: 1660(J)

construction in UK, 11: 5039(J)

control rods, 11: 2097, 2099, 2727, 5009

critical mock-up of Army, design, 11: 11767

criticality studies, 11: 1976, 2099, 2102

design and feasibility of 10 Mw, non-boiling homogeneous, 11: 12530

design of homogeneous type, 11: 13902

design of sodium-cooled, graphite-moderated, 11: 13176

design of 10 Mw homogeneous boiling, 11: 12531

emergency shutdown by poisoning with B, 11: 13877

feasibility, 11: 7717

fuel element fabrication and testing, 11: 3576(J)

fuel element testing, experimental program for, 11: 12623

irradiated fuel element storage and shipping, shielding requirements, 11: 2195

operation and engineering, 11: 9111(J)

radiation hazard, 11: 2097, 2099, 2100, 2101

thermal stress in pressure vessel, 11: 2098

use in missile launching sites, 11: 9120(J)

Packed columns

absorption of metals by, 11: 7145(R)

application to Redox Process, 11: 11971

evaluation of sieve plates for steam stripping of TBP from evaporator feed streams, 11: 10477

Heligrid, for producing polymer for B isotope separation, 11: 7461

hydraulic test of 36-in. diameter Higgins, 11: 12698

mass-transfer coefficients, 11: 1828(J)

Packed columns (cont'd)

operation of dual-temperature single stage tower for D_2 concentration, 11: 1788

performance, 11: 8333

performance, gas-phase mass transfer coefficients, 11: 9258(J)

performance for fission product removal, pilot plant, 11: 7138

performance of liquid-liquid annulus for U extraction, 11: 6230

performance for removal of radioisotopes from pure water, 11: 5264

resin test loop study, 11: 3754

solvent extraction performance of IC columns using Raschig ring packing, 11: 12999

Packing

See Column packing; Pipe joints; Seals and glands.

Paducah plant

See Gaseous diffusion plants.

Paints

contamination with fission products, 11: 5732

decontamination, 11: 4246, 5732

heat and corrosion-resistant, testing for steel, 11: 3385(R), 3386(R)

protective water resisting, radiation damage, 11: 13725

visibility under water, 11: 13006

Pair production

(See also Ion pair production.)

absolute cross section in Pb at 1.12 Mev, relative measurement, 11: 12760(J)

angle between photon and electron directions in, in nuclear emulsions, 11: 4966(J)

by beryllium (Be^9)γ rays in photographic emulsion, 11: 8967(J)

in condensed media at high energies, multiple scattering effects, 11: 574(J)

cross section in Pb for gamma rays of Na^{24}, 11: 1251(J)

cross section of spin ½ particles possessing anomalous magnetic moment, 11: 10672(J)

cross sections, 11: 3509

cross sections in Pb and Al at 2.5 Bev, 11: 11378(J)

by fast charged particles, cross sections, 11: 4026(J)

ionization at origin of high-energy, 11: 10337(J)

large angle, in lead, 11: 11266(J)

longitudinal polarization at relativistic energies, 11: 10351(J)

mean free path for direct, by 1- to 100-Bev electrons, 11: 3513(J), 3518(J)

in nuclear transition 0 → 0, theory, 11: 557(J)

theory of, in a screened field, 11: 6025(J)

Palladium

deuteron spectra from (p,d) reaction, 11: 9495(J)

diffusion of H_2 through active and inactive, mechanism, 11: 12757

electroplating of slugs by, 11: 9737(R)

heat capacity below 4.2°K, 11: 12762(J)

K fluorescence yield, 11: 5545(J)

neutron total cross sections and resonance parameters, 11: 9078(J)

neutron total cross sections at 14 Mev, 11: 2026(R)

paramagnetic susceptibilities, 11: 1914(J)

separation from fission products, 11: 7430(R)

Palladium–bismuth alloys

See Bismuth–palladium alloys.

Palladium catalysts

catalytic effects for recombining radiolytic gases, 11: 4265

Palladium fluorides

crystal structure of PdF_3, 11: 3711(J)

Palladium hydrides

lattice constants and phase studies, 11: 5333

Palladium isotopes

yields of, produced by reaction of π^- mesons with Ag, 11: 3022(J)

Palladium isotopes Pd^{108}

Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

neutron activation cross sections, 11: 9752(R)

Palladium isotopes Pd^{110}

Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

Palladium isotopes Pd^{111}

isomeric, half-life determination, 11: 9490(J)

Palladium–nickel alloys
See Nickel–palladium alloys.

Palladium–tritium systems

phase studies at 0, −80, and −100°C, 11: 1016

Palladium–uranium alloys

constitution diagrams, 11: 4464(R)

crystal structure, thermal analysis, heat treatment, constitution diagram, and preparation, 11: 1901(J)

electronic structure, 11: 6413(J)

paramagnetic susceptibilities, 11: 1914(J)

thermal analysis, 11: 13042

Panaca Area (Nev.)

geology, mineralogy, U occurrence, and exploration, 11: 3403

Panels
See Structural panels.

Paper

(See also Filter papers.)

ignition and thermal radiation damage, 11: 7359

Paper chromatography
See Chromatography.

Parabiosis

influence on radioinduced changes in blood pressure in rabbits, 11: 9937(J)

Paraffin

neutron attenuation, 11: 5531

thermal conductivity from 2 to 82°C, 11: 1855(J)

Paraffins
See Alkanes.

Parallel plate detectors

design and performance of proton-recoil, for detection of fast neutrons, 11: 10651

Paramagnetic materials

neutron inelastic scattering by, 11: 4610(J)

Paramagnetic resonance
See Magnetic resonance.

Paramagnetic salts

magnetic resonance relaxation time of protons in aqueous solutions, 11: 6040(J)

proton spin relaxation, 11: 6559(J)

Paramecium

radiosensitivity, 11: 845(J), 1738(J), 11861(J), 12642(R)

Parasites

control of mange mite on mice and dogs, 11: 7910(R)

control of Trichinella, Ascaris, and Hymenolepis nana by irradiation, 11: 830(R)

radiosensitivity, 11: 3274(R)

Paria Plateau Quadrangle (Ariz.)

photogeologic map, 11: 1099(J), 1108(J), 1116(J)

Parsonsites

identity and conditions of deposition, chemical, optical, and x-ray data, 11: 1871(J)

Partial differential equations

solutions, 11: 1236(J)

Particle collectors

(See also Electrostatic precipitators; Filters.)

decontamination, equipment for, 11: 11104

efficiency and performance, 11: 3886(R)

electrostatic generator efficiency, 11: 7400(R)

performance and design of wet scrubber, 11: 10123

Particle precipitators

(See also Cyclone separators; Electrostatic precipitators; Wire-mesh entrainment separators.)

conditioning techniques for gas particles to obtain high separation efficiencies, 11: 8434(R)

efficiency for air cleaning, 11: 8837

performance, 11: 8793(R)

performance, in handling kilogram quantities of powders, 11: 13263

Particle statistics

in multiple formation processes at 1 to 5 Bev, 11: 11356(J)

tables on energy, mass, momentum, 11: 6867

Particle tracks

(See also Photographic film detectors.)

analysis with digital computer, 11: 11325

boiling density along, 11: 2215(J)

measuring instrument for cloud chamber, 11: 1604(J)

probability of finding an ordinate to a point on the chord of electron ionization, track arc, 11: 7274(J)

Particle trajectories

Hill equation resonance studies for FFAG accelerators, 11: 10637

Particles

(See also Aerosols; Alpha particles; Beta particles; Charged particles; Cosmic particles; Dusts; Elementary particles; Nuclear particles; Powders; S particles; V particles.)

chemical evidence of free radical formation in liquids by ionizing, 11: 4343(J)

Cherenkov radiation of neutral, with a magnetic moment, 11: 3031(J)

counting and sizing, 11: 2965(J), 4426

counting and sizing instruments, design, 11: 8973

dispersal in atmosphere, meteorological factors, 11: 6615

flow properties of fine, 11: 3440

harmonic analysis of motions which exhibit invariant phase curves, 11: 2971

high-energy, theory, 11: 1286(J), 2216(J), 5698(J), 6181(J)

Particles (cont'd)
inhalation, 11: 12961(R)
interacting, propagation function, method of determination, 11: 8238(J)
lung deposition of radioactive, effects of particle size, 11: 12959(R)
mass measurements on, from emulsion tracks, 11: 9009(J)
motion in spirally ridged accelerators, 11: 3155, 3158, 3173
pathological effects of foreign-body, implanted under skin by blast, 11: 5128
penetration into various materials, 11: 2208(J), 4417
photoelectric counting of, in the sieve range, 11: 7247(J)
polarization of beam of spin one, after elastic scattering by spin zero nuclei, 11: 9180(J)
pulmonary absorption, effects of particle size, 11: 8258(R), 11018
research on, review, 11: 1940(J)
scattering matrix for, 11: 735(J), 2217(J), 4209(J)
size distribution and density measurements of, with light and electron microscopes, 11: 8791(R)
size distribution in fluidized beds, 11: 9223
size measurement, turbimetric and pipette methods compared, 11: 8258(R)
size measurements, 11: 12961(R)
size measurements, design of instruments, 11: 8973
spectra of systems of interacting, 11: 8233(J)
spinor, interaction potential, calculated by relativistic quantum electrodynamics, 11: 2218(J)
stochastic motion, generalized problem, 11: 8237(J)
storage, change of volume of a region of phase space, 11: 3171
terminal velocity and specific gravity of radioactive, methods of measurement, 11: 7174(J)
time correlation function for interacting, up to mean free path time, 11: 9178(J)
tissue distribution following pulmonary and intestinal absorption, tracer study, 11: 2808, 4249, 5735(J)

Passivation
of electrolytic iron by OsO_4, 11: 1519

Pasteurization
See Sterilization.

PCTR
See Physical Constants Testing Reactor.

Peanut Mine (Colo.)
occurrence of duttonite in, 11: 13328(J)

Pearsol Valley (Idaho)
exploration, geology, mineralogy, placer deposits, 11: 4866

Peat
age estimation of Ozegahara, by C^{14} counting, 11: 771(J)

Pectins
radiation effects, 11: 967(J)

Pegmatites
age determinations using K–Ar and Rb–Sr decay, 11: 290(J)

Peninsular ChemResearch, Inc., Gainesville, Fla.
progress reports on development of fluoro-silicone elastomers, 11: 144(R)

Pennsylvania Research Reactor
criticality studies, control rods, and reactivity, 11: 6535
fuel element testing, 11: 1618(R)

Pennsylvania State Coll., University Park. Mineral Industries Experiment Station
progress reports on mineralogy, petrography, and paleobotany of U-bearing shales, 11: 7190(R)

Pennsylvania State Univ., University Park
progress reports on effect of radiation on dynamic properties of high polymers, 11: 11107(R)

Pennsylvania State Univ., University Park. Coll. of Chemistry and Physics
progress reports on coordination polymers, 11: 207(R), 2876(R)

Pennsylvania State Univ., University Park. Coll. of Mineral Industries
progress reports on chemical nature of organic matter of uraniferous shales, 11: 9986(R)
progress reports on uranium distribution in minerals, 11: 4440(R)

Pennsylvania State Univ. University Park, Mineral Industries Experiment Station
progress reports on flotation characteristics of Florida phosphate leached zone material, 11: 976(R)

Pennsylvania State Univ., University Park. Petroleum Refining Lab.
progress reports on fluids, lubricants, and fuels, 11: 910(R), 4419(R), 8826(R), 12670(R)

2,4-Pentanedione
solvent properties for Bi, Ce, Cu, Hf, Fe, Pb, Th, U, Zn, Zr, 11: 11123
solvent properties in extraction of ferrous metals, 11: 10442

2,4-Pentanedione complexes
with Cu, absorption spectra, 11: 164
radiation damage in Szilard-Chalmers reaction, kinetics of isothermal annealing, 11: 13550(J)

2,4-Pentanedione, trifluoro-
solvent properties for Pu^{4+}, 11: 12369

3-Pentanol, 2,4-dimethyl-
solvent properties for Pa, 11: 7539(R)

2-Pentanone, 4-methyl-
absorption in water, 11: 13006
analysis for uranium nitrate hexahydrate, 11: 7439
recovery from raffinate solutions, 11: 13668
solvent properties and applications in Redox Process, 11: 13022
solvent properties for recovery of U^{233}, 11: 7553
solvent properties for U in ore solutions, 11: 11570
toxicity and explosion hazards, 11: 985

2-Pentanone, 4-methyl--acetic acid–water systems
See Acetic acid-2-Pentanone, 4-methyl--water systems.

2-Pentanone, 4-methyl--ammonium nitrate systems
See Ammonium nitrate-2-Pentanone, 4-methyl--systems.

2-Pentanone, 4-methyl--nitric acid systems
See Nitric acid-2-Pentanone, 4-methyl--systems.

2-Pentanone, 4-methyl--water systems
intermolecular association of, infrared absorption measurements, 11: 7425

Pentosenucleic acids
See Nucleic acids.

Pepsin
radiation chemistry, 11: 5136(R)
radiation effects on solutions, 11: 9916(R)
radiation induced reactions with 2,4-dinitrophenylhydrazine, formation of >C = O bonds in, 11: 11920

Peptides
radiation effects, 11: 1465, 2254(R)

Perchlorates
exchange of Cl between chlorates and, 11: 9664(R)

Perchloric acid
dissociation constant in wet bis 2-chloroethyl ether, 11: 9186(R)
radiation effects, 11: 4347(J)

Perfluoroörganic compounds
synthesis, 11: 2286

Periodic systems
dependence of compressed elements on atomic number order in, 11: 10589(J)
Mendeleev, and modern physics and chemistry, 11: 9524(J)
metallo chemical table of chemical elements, 11: 10095(J)

Peritectic reactions
See Phase studies.

Permanganates
neutron irradiated effect of changes in hydration on recoil fragments in, 11: 11110(J)

Perovskites
magnetic properties of, neutron-diffraction study, 11: 9993(J)

Peroxidases
radiosensitivity of tryptophan, in rat liver, 11: 12642(R)

Peroxides
inactivation of E. coli B, by, 11: 11030(J)
of thorium, Zr, Ti, Sn, Y, and La, preparation and properties, 11: 3687(J)
volumetric determination, 11: 12960(R)

Perrhenate ions
reduction, controlled potential electrolytic, 11: 13577(R)

Pertechnetates
chemical reactions, 11: 13577(R)
corrosion inhibition of steels in aqueous solutions, 11: 8286(R), 11676
reduction, controlled potential electrolytic, 11: 13577(R)

Perturbation theory
many-body, 11: 10794(J)
renormalization group applied to improvement of formulas in, 11: 802(J)

Peteosthor
See Radium isotopes Ra^{224}.

Petroleum
containers and facilities for gaseous, effects of nuclear explosion, 11: 9905
corrosive effects, oxidation, and thermal stability, 11: 910(R)
neutron activation analyses for Cl, As, and Br, 11: 8296(R)
radiation processing, new facilities for, 11: 10023(J)

pH
See Hydrogen ion concentration.

pH meters
glass electrode-vibrating reed electrometer, 11: 7430(R)

Phantoms
chest, for use in radiologic dosimetry, development, 11: 2991(J)
radiation dosage determinations, effect of exposure geometry on pattern, 11: 8780(J)
tissue-equivalent material, 11: 1606(J)

Pharmaceuticals
(See also Drugs.)
mechanisms of action, tracer studies, 11: 63(J)

Phase diagrams
See Constitution diagrams.

Phase studies
(See also Constitution diagrams; Diffusion; Grain growth; Solutions.)
critical phase energy systems of pure electroneutral phases, 11: 11062(J)

Phase studies (cont'd)
equipment for Bi–$BiCl_3$ and U–UCl_3 systems, 11: 4812(R)
experimental methods, review, 11: 4497(J), 6427(J)
of fluorocarbon binary mixtures between 173 and 193°K, 11: 949(J)
heat transfer in, review, 11: 5300(J)
lattice deformation determination by measuring relation of magnetostriction to temperature, 11: 4474(J)
nucleation of voids during creep and diffusion in metals, 11: 4463
of radioelements in liquid and solid phases, 11: 9519(J)
state transformations of substances, statistical mechanics of, 11: 10642(J)
statistical order-disorder analysis in multicomponent fluid mixtures, 11: 9394(J)

1,10-Phenanthroline
analytical use in spectrophotometric determination of Ru, 11: 13271(J)

Phenols
titration in acetone using tetra-alkyl ammonium hydroxide, differentiating, 11: 8846(J)

Phenyl ether–biphenyl systems
See Biphenyl–phenyl ether systems

Phenylbenzene
See Biphenyl.

Phenylglycolic acid
See Mandelic acid.

Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho
progress reports, 11: 1276(R), 4685(R)
progress reports on MTR, 11: 8677(R)
progress reports on MTR and physics, 11: 7826(R)
progress reports of MTR technical branch, 11: 12888(R), 13430(R)
progress reports on nuclear technology, 11: 9052(R)
progress reports on radiation damage, 11: 10353(R)

Phosphatase activity
alkaline, radiosensitivity in rat kidneys, 11: 8788(J)
in various mouse tissues following total-body x irradiation, 11: 22(J)

Phosphatases
thymic levels, effects of x irradiation in mice, 11: 1745(J)

Phosphate deposits
occurrence and U distribution in Idaho, Colo., Mont., and Wyo., 11: 3405
occurrence of U hearing, in U. S. and Alaska, 11: 10084(R)

Phosphate deposits (Fla.)
occurrence in De Soto and Hardee Cos., 11: 2909(J)

Phosphate deposits (U.S.)
bibliography on geology of U-bearing, 11: 11190

Phosphate deposits (Wyo.)
occurrence in northwestern Wyo., 11: 5870(J)

Phosphate fertilizers
See Phosphates.

Phosphate glass
silver-activated, for gamma isodose distribution determination, 11: 1594(J)

Phosphate rocks
(See also Phosphates.)
analysis for uranium content, 11: 930, 3405
beneficiation by scrubbing and desliming, 11: 2347

Phosphate rocks (cont'd)
bibliographies of the geology of U bearing, in the U. S., 11: 13330(J)
processing for U recovery, 11: 988, 2319(R), 2322, 2324(R), 2861, 3221(P), 3224(P), 3238(P), 5821(J), 5358, 11512(P)
uranium, mode of occurrence, 11: 8915(J)
uranium recovery, 11: 9535(P)
Phosphate slimes
flocculating agents for, preparation and evaluation, 11: 2815
uranium recovery from, 11: 2307
Phosphate slurries
filtering rates for digested, 11: 5263
Phosphates
(See also phosphates of specific elements.)
coloration and luminescence, 11: 5376(J)
complexing effect on U adsorption, 11: 2326(R)
crystal structure of $Mo(PO_3)_3$, 11: 7955(J)
polymerized, absorption of Fe^{3+}, Co^{2+}, Li^+, and UO_2^{2+} compounds on, 11: 4373
precipitated, radioassay of products from, 11: 2276
separation of V from, 11: 3240(P)
solubility in raffinate liquors, 11: 9583
solvent extraction of U from, 11: 4842(R)
solvent properties, 11: 11563(R)
spectrophotometric determination in $Th(NO_3)_4$, 11: 10812(R)
uranium recovery, effect of precipitants on, 11: 2326(R)
uranium recovery by anion exchange, 11: 11500(P)
Phosphinates
solvent properties, 11: 2356
solvent properties, evaluation for U extractant, 11: 8869(R)
solvent properties for U and Pu, and physical properties, 11: 5762
Phosphine oxides, trialkyl-
extractant in fluorimetric determination of U, 11: 1430
preparation and solvent properties, 11: 2356
solvent properties, evaluation for U extractant, 11: 8869(R)
solvent properties for Ce, Y, Zr, Nb, and Ru, 11: 7969
solvent properties for elements in acidic solutions, 11: 2855
solvent properties for U and Th, 11: 10036(R)
Phosphines
preparation of perfluoromethyliodo-, 11: 3768(R)
reduction of alkylchlorophosphines with $AlLiH_4$ and LiH, 11: 80
Phosphinic acid
solubility and distribution, 11: 2335
solvent properties for U and Th, 11: 11647(R)
synthesis, 11: 11647(R)
Phosphites
(See also Hypophosphites.)
solvent properties, evaluation for U extractant, 11: 8869(R)
Phosphonates
biochemical effect on brain cholinesterase of diisopropylfluoro-, 11: 7091(R)
distribution in rats of diisopropylfluoro-, 11: 7091(R)
polymerized, absorption of Fe^{3+}, Co^{2+}, Li^+, and UO_2^{2+} compounds on, 11: 4373
solvent properties, 11: 2356
Phosphonates (cont'd)
solvent properties, evaluation for U extractant, 11: 8869(R)
solvent properties for U and Pu, and physical properties, 11: 5762
Phosphonic acid, derivatives
solvent properties for U and Pu, and physical properties, 11: 5762
Phosphonic acids
preparation and solvent properties, 11: 2356
solvent properties for U and Th, 11: 11647(R)
synthesis, 11: 11647(R)
Phosphor bronze
rupture discs, effects of gaseous detonation on, 11: 1541
Phosphoria Formation (Idaho)
stratigraphy and petrography at Falls Creek, 11: 5870(J)
Phosphoria Formation (U. S.)
literature, field, and laboratory reconnaissance for U, 11: 3405
Phosphoria Formation (Wyo.)
stratigraphy, exploration, and geology, 11: 5870(J)
Phosphoric acid
corrosive effects on Ti and Ti alloys, 11: 7185
economics of Fe reduction, 11: 2854
recovery of U from, 11: 3238(P)
solvent extraction of U, 11: 7970
uranium recovery by ion exchange, 11: 2325(R)
uranium recovery by precipitation with KOH and $Ca(OH)_2$, 11: 2391
uranium recovery from wet process, 11: 2854
Phosphoric acid, alkyl esters
(See also specific esters; e.g., Butyl phosphates.)
preparation and solvent properties, 11: 2356
solvent properties, evaluation for U extractant, 11: 8869(R)
solvent properties for Ce, Y, Zr, Nb, and Ru, 11: 7969
solvent properties for metals, 11: 4841, 4842(R)
solvent properties for rare earths and organic compounds, 11: 3325(R)
solvent properties for U, 11: 1823(R), 8864
solvent properties for U, Th, rare earths, Co–Ni, and Hf–Zr, 11: 10036(R)
Phosphoric acid, butyl esters
See Butyl phosphates.
Phosphoric acid–butyl phosphate systems
See Butyl phosphate–phosphoric acid systems
Phosphoric acid, esters
hydrogen bonding in interactions of di(2-ethylhexyl), 11: 11072(J)
solvent properties for U and Pu, and physical properties, 11: 5762
solvent properties for U and Th, 11: 11647(R)
thermal stability, 11: 207(R)
synthesis, 11: 11647(R)
Phosphoric acid–nitric acid–thorium oxide systems
See Nitric acid–phosphoric acid–thorium oxide systems
Phosphoric acid, ribulose esters
preparation, large-scale, 11: 7091(R)
Phosphoric acid–thorium nitrate systems
solubility and viscosity, 11: 10973
Phosphoric acid–uranium oxide systems
radiation stability, vapor pressure, thermal expansion, and corrosive properties, 11: 1837

Phosphoric acid–uranium(VI) oxide systems
criticality studies, 11: 12505
Phosphoric acid–uranyl phosphate systems
corrosive effects on steel, 11: 7458
radiation effects on recombination, 11: 7458
Phosphorite
See Phosphate rocks.
Phosphors
(See also Luminescence; Phosphorescence; Scintillation detectors.)
boron-loaded liquid, for neutrons, 11: 10192(J)
conversion efficiencies, method of measurement, 11: 11322
crystal, response to nuclear radiation, 11: 12070
development of liquid mixture for use with tritiated water, 11: 8082
development of plastic, 11: 12916(R)
double solute liquid, 11: 9021(J)
efficiency of toluene solutions, 11: 10231(R)
energy transport by cascade and resonance processes, 11: 9349(J)
excitation mechanisms in sulfide, 11: 417(J)
glass, for detection of intermediate energy neutrons, 11: 12151(J)
incorporating C^{14}, preparation, 11: 7281(J)
luminescence changes in organic solids, applications to dosimetry, 11: 9409(J)
luminescence of, activated with trivalent U, 11: 12311(J)
luminescence spectra of rare-earth diffusion into, at 700 to 1300°, 11: 12297(J)
paramagnetic resonance in SrS(Eu), CaF_2(Eu), SrS(Gd), and SrS(Tb) at room temperature, 11: 12145(J)
phoswich system for particle identification, 11: 9023(J)
photoconductivity, 11: 1178(R), 1179(R)
physical properties, 11: 1690(J), 6479(J)
physical properties of organic liquid, 11: 550(R), 3964(J)
physical properties of a plastic fluor containing terphenyl, alpha-naphthyl phenyloxazole, and zinc stearate in a styrene base, 11: 1580
preparation and properties, review, 11: 9992(J)
preparation and properties of mixed scintillating media for radiation dosimetry, 11: 4942(J)
preparation for fast neutron detector, 11: 1602(J)
preparation of cadmium octoate for use in triethylbenzene-base liquid scintillators, 11: 1238
preparation of large heavy, 11: 1542(R)
preparation of organic, 11: 3963(J)
preparation of plastic, 11: 1705(J), 1981
preparation of stilbene, anthracene, tolane, and naphthalene, 11: 3636(P)
radiocarbon dating with liquid CO_2 as diluent in scintillation solution, 11: 9022(J)
scintillation behavior of toluene solutions and plastics, 11: 2026(R)
scintillation decay times, measurement, 11: 517(J)
standardization of emission, method, 11: 10231(R)
teflon containers, 11: 7291(R)
thallium activated CsI for spectroscopy, 11: 9016(J)
zinc-sulfide, luminescence activation by Sr^{90} and Cs^{137}, 11: 10183(J)
Phosphors (liquid)
ultrasonic degassing, 11: 9025(J)
Phosphorus
as corrosion inhibitor when admixed to oils, tracer study, 11: 279(J)
metabolism, effects of irradiation, tracer study, 11: 20, 28(J), 3665(J), 4789(J)
metabolism, effects of vitamin D in cattle, 11: 5134(R)
neutron activation determination, 11: 1980, 4315(J)
neutron reactions, effect on gas formation, 11: 3577
plant metabolism, tracer study, 11: 1492(J), 5750(J)
proton reactions, gamma rays from, 11: 1673(J)
protons scattered at 96 Mev by, energy spectrum, 11: 612(J)
radiochemical determination in HRT fuel solution, 11: 12343
separation from irradiated S, 11: 5097(P), 6582(P), 9528(P), 9529(P)
solubility in saturated water, effects of radiation, 11: 2237(R)
tissue distribution, tracer study, 11: 70(J), 901(J), 1761
Phosphorus acids
acidity function vs. temperature, 11: 5768(J)
aromatic, recovery of U by precipitation with, 11: 3224(P)
radiation effects, 11: 4348(J)
solvent properties and cation complexing, 11: 11576(R)
Phosphorus chlorides
neutron irradiation, chemical species of PCl_3 produced during, 11: 4335(J)
Phosphorus compounds
analysis by nuclear magnetic resonance spectroscopy, 11: 122(J)
organic, use in extracting U, Th, Pu, and fission products, 11: 9663
polymerization, 11: 2876(R)
Phosphorus isotopes P^{29}
energy levels, 11: 4716
Phosphorus isotopes P^{30}
energy levels, 11: 550(R), 3038(J), 12186(R)
Phosphorus isotopes P^{31}
alpha particles reactions (α,p), angular distribution of protons from, 11: 6113(J)
deuteron reactions (d,p), angular distribution of protons from, 11: 4719(J)
deuteron reactions (d,p)P^{32}, investigation by magnetic analysis, 11: 11454(J)
energy levels, 11: 1542(R), 8155(J)
energy levels from proton scattering data, 11: 9186(R), 10706(J)
neutron reactions (n,p), 11: 2607
proton reactions (p,$\alpha\gamma$) and (p,p'γ), 11: 9189(R)
proton reactions (p,n), 11: 3047(J)
Phosphorus isotopes P^{32}
applications in diagnosis of intraocular neoplasm, 11: 7928(J), 8817(J)
beta decay, Fierz interference, 11: 8117(R)
beta particles from, longitudinal polarization of, 11: 9459(J)
beta spectra, calorimetric determination of energy, 11: 12940(J)
beta spectra, evidence for small deviations from the allowed shape, 11: 10704(J)
bone deposition, effect of age, 11: 11877(R)
bone deposition in young mice, effects of cysteamine treatment, 11: 11907(J)
determination in rain water, 11: 5419(J)
determination in reactor cooling water, 11: 936(J), 2242(R)

Phosphorus isotopes P^{32} (cont'd)
effects on protein metabolism during hemorrhage, 11: 3664(J)
energy levels, spin and parity, 11: 11454(J)
formation in neutron-irradiated foodstuffs, 11: 5733
formation in neutron-irradiated KH_2PO_4, 11: 8286(R)
half lives, 11: 1475(R)
as impurity in S^{35}, measurement, 11: 1993(J)
preparation of carrier-free, 11: 1972(J)
preparation of high specific activity, 11: 12330(R)
radiation dosage determinations in tissue, 11: 3479(R)
therapeutic applications against malignant tumors, 11: 6217
therapeutic applications in leukemia, 11: 4801(J)
tissue distribution in rats following ingestion in food, 11: 2242(R)
tracer application in biological studies, factors affecting dispersion, 11: 9208(J)
tracer applications in metallurgical studies, 11: 1143(J)
tracer applications in studies of synthesis of ribonucleic acid, 11: 1492(J)
tracer studies of pyrophosphate process with, 11: 9744
Phosphorus isotopes P^{33}
determination in rain water, 11: 5419(J)
Phosphorus sulfides
chemical shifts and spin-spin interactions, 11: 4814(R)
Phosphoryl chloride complexes
with zirconium chloride, density and surface tension, 11: 13576(R)
Phosphoryl chlorides
chemical reactions and separation from $ZrCl_4$, 11: 2278(R)
Phosphuranylites
identity and conditions of deposition, chemical, optical, and x-ray data, 11: 1871(J)
Photoconductivity
bibliographies, 11: 4491
Photoelectric cells
(See also Crystal detectors; Photomultiplier tubes.)
spectrum plate comparator, scanning device, 11: 7405(R)
Photoelectric effect
azimuthal distribution of K electrons emitted by polarized photons, 11: 12081(J)
longitudinal angular dependence of, and its influence on determination of γ-ray intensities, 11: 10593(J)
Photoemission
See Photoelectric effect; Photoneutrons.
Photographic emulsions
(See also Nuclear emulsions; Photographic film detectors.)
application to measurement of neutron flux distribution, 11: 2974
Photographic film detectors
(See also Nuclear emulsions.)
for beta particles, 11: 12155(J)
calibration, 11: 506(J)
design for β in presence of weak γ, 11: 13571(R)
design of photometer for use in reading, 11: 1588(J)
performance, 11: 8792(R)
performance for β skin dose measurements, 11: 10178
Photographic film detectors (cont'd)
performance for detection of γ radiation from Am^{241}, 11: 4937
performance for γ and neutron dosimetry, 11: 8791(R)
performance for γ dosage determinations from multiple γ-ray sources, 11: 6821(J)
performance for investigation of reaction boron isotopes $(\alpha,p)C^{13}$, 11: 3101(J)
performance for x-radiation dosimetry, 11: 6477
performance in measuring neutron spectrum emerging from fast reactor at 0.4 to 15 Mev, 11: 12210
Photography
(See also Cameras; Neutron photography; Spark shadowgraph photography.)
of biological phenomena of blast, 11: 1924
design of timer for precise photographic processing, 11: 7250(J)
documentary, during Teapot Operation, 11: 7040
optical system to improve bubble chamber, 11: 1565
Photomesons
characteristics of heavy, 11: 12823(J)
production, relativistic dispersion relation approach, 11: 10220(J)
production from H, angular distribution, 11: 10679(J), 11342(J)
production of K, from polyethylene, 11: 13406(J)
production of K, from single nucleons, 11: 11336(J)
production of K, in hydrogen, 11: 11337(J), 13405(J)
Photomesons (π)
production of, at complex nuclei, 11: 13407(J)
ratio of negative to positive in non-relativistic theories of production, 11: 3983(J)
Photomesons (π^0)
production as a function of atomic weight, 11: 4115
production from H at forward angles from 240 to 480 Mev, 11: 11339(J)
production in H for photon energies of 150 to 240 Mev, 11: 5992(J)
Photomesons (π^+)
production, Z dependence, 11: 5987(J)
Photometers
design for reading film badges, 11: 1588(J)
measurement of reflectivity of ores with a photoelectric cell attachment, 11: 13329(J)
Photomultiplier tubes
characteristics, 11: 6863(R)
circuits, design of stabilized, 11: 11544(P)
design of transistorized, 11: 10620(J)
development, 11: 1245(R), 1246, 1247(R), 1965(R), 3464(R), 5410(R), 6482(J), 7291(R)
development of neutron sensitive, 11: 6824(J)
development research at DuMont Labs., 11: 12107(R)
electron transit time in commercial, 11: 6856
fatigue effects in scintillation counters, 11: 1991(J)
gain stabilization, 11: 5970(J), 6441
individual dynode voltage regulation system, 11: 6786(J)
noise reduction by dark adaptation, 11: 507(J)
for particle counting use in the sieve range, 11: 7247(J)
performance in γ spectrometers, 11: 2597

Photomultiplier tubes (cont'd)
potting of, for use with liquid scintillation detectors, 11: 1605(J)
pulse shapes and rise times, 11: 9188(R)
recent improvements in French, 11: 10656(J)
research programs, 11: 11301(R), 11302(R)
response, energy dependence, 11: 10231(R)
response and characteristics of FEU-12, 11: 5418(J)
response of RCA 931-A, 11: 1963
testing methods, 11: 9402
transit time, 11: 6482(J)

Photon spectra
measurements with Compton electron spectrometer, 11: 4579(J)

Photoneutrons
angular distribution of, from Be and C, 11: 697(J)
binding energy from Fe, Ge, Rb and Hf, 11: 1277(R)
cross sections for, induced by Li γ rays, 11: 704(J)
energy and angular distribution from Pb, 11: 1277(R)
production in HRE and effect on HRE kinetic behavior, 11: 8587
from tantalum Ta^{181} above giant resonance by direct excitation, 11: 9142(J)
yields from intermediate and heavy nuclei, 11: 4130(J)
yields from natural Mg, 11: 3088(J)

Photons
(See also Gamma radiation; X radiation.)
absorption, corresponding to a temperature of 1 to 2 kev, 11: 14024
angular correlations in the two-photon Compton effect, 11: 10349(J)
angular distribution, from nuclear reactions, 11: 2045(J)
cascade showers produced by, in light and heavy elements, 11: 4627(J)
inelastic scattering by In^{115} at 5 to 27 Mev, yields and cross sections of, 11: 12927(J)
instrument for sorting monochromatic, from continuous bremsstrahlung, 11: 3922(J)
matricial theory, 11: 10592(J)
nonlinear electromagnetism equations, 11: 10372(J)
nuclear photoeffect in light nuclei, 11: 9086(J)
nuclear reactions, 11: 12916(R)
nuclear reactions, bibliography, 11: 11447
nuclear reactions, individual and collective aspects, 11: 12274(J)
nuclear reactions, measurement, 11: 11450(J)
nuclear reactions and the giant resonance, 11: 11455(J)
nuclear reactions (γ,β), Migdal's and Khokhlov's calculations, 11: 11350(J)
nuclear reactions (γ,d), 11: 12276(J)
production of monochromatic, by positron annihilation, 11: 10591(J)
properties of, in high-energy Compton effect, 11: 1689(J), 1950(J)
radiation theory of arbitrarily small mass, 11: 9522(J)
resonance in photonuclear reactions, theory, 11: 9186(R)
scattering by free electrons, 11: 2179(J)
scattering by nucleons, 11: 4156(J), 4157(J)
scattering by protons, cross sections, 11: 3191(J)
scattering from protons and deuterons, 11: 9505(J)

Photoperiodism
(See also Light.)
effects on CO_2 fixation by algae, tracer study using C^{14}, 11: 4814(R)
physiological effects on Xanthium, 11: 12642(R)

Photoprotons
angular and energy distribution from Ni and Al reaction at 85 ± 5 Mev, 11: 8204(J)
angular dependence of Z dependence, 11: 10329
angular distribution of, from oxygen, 11: 9085(J)
from carbon, Be, and O, 11: 700(J)
detection and measurement, design of moving plate camera for, 11: 7278(J)
energy and angular distribution and yields from Al, Cu, Rh, and Au, with 70 Mev x rays, 11: 2147(J)
from nickel by 17.5 Mev bremsstrahlung, 11: 7336(J)

Photosynthesis
(See also Chlorophylls.)
in algae, 11: 4814(R)
in algae, C^{14} distribution, effect of killing, 11: 7091(R)
bibliographies, 11: 2777
carbon(C^{14}) studies of, separation, identification, and determination of compounds in, 11: 9591(R)
conference held in Moscow, U.S.S.R., Jan., 1957, 11: 10393(J)
photochemical reactions, 11: 2254(R), 2777
sucrose-synthesis intermediates during, 11: 12341(R)
theory and tracer studies, 11: 12661
tracer studies, 11: 17(J), 3330(R)

Photosynthetic products
synthesis of C^{14}-labeled citrulline, 11: 1491

Phototubes
See Photoelectric cells.

Photovoltaic cells
See Photoelectric cells.

Physical chemistry
(See also Thermodynamics.)
review of Russian contributions, 11: 7941(J)

Physical Constants Testing Reactor
mechanical components, specifications and characteristics, 11: 649
reactivity, 11: 8116(R)

Physics
(See also Astrophysics; Biophysics; Geophysics; Health physics; Mathematics; Nuclear physics.)
research programs in solid state, bibliographies and summaries of, 11: 3847

Physics conferences
Academy of Sciences, U.S.S.R., Feb. 21, 1957, 11: 8036(J)
on neutron source preparation and calibration, 11: 5489
on nuclear constants, Chalk River, Jan. 1956, 11: 11555(R)

Piezoelectric crystals
vibration detection in particle bombarded materials using, 11: 2757

Pigeons
See Birds.

Pigs
See Swine.

Piles
See Exponential piles; Reactors; Sigma piles.

Pinacol
rearrangement, migration of phenyl- and paratolyl- groups in, 11: 10435

Pinky pile
See Sigma piles.

Pins
See Reactor fuel pins.

Pions
See Mesons (π).

Pipe fittings
critical and subcritical flow through sharp-edged orifices and, 11: 5833

Pipe joints
(See also Gaskets; Seals and glands.)
bend tests of shrink fit, 11: 10861
closing and sealing, design status, 11: 4429(R)
pressure drop in tees, 11: 2425
thermal stresses in, 11: 2416
welding, 11: 13780

Pipes
(See also Tubes.)
applied loading, evaluation of codes for, 11: 8890
buried stainless steel, design status, 11: 4429(R)
corrosion of carbon steel by Savannah River water, 11: 2900
corrosion of stainless steel, cast iron, and galvanized steel by soil, 11: 2479
corrosion of stainless steel, cast iron, and galvanized steel by soil, 11: 2479
critical dimensions of, carrying U^{235}–D_2O solutions, 11: 6520
design for, between pulse generator and column in Redox Process, 11: 2342
flow, characteristics of two-phase in, 11: 13312(J)
fluid flow through 90° elbow, velocity distribution, 11: 2427
leak testing, 11: 5845
preparation and testing of Ti-lined, for standard ring-joint gaskets, 11: 3843
protection methods for buried radioactive waste lines, 11: 7983
stresses, effect of dumping HRT fuel, reflector and blanket on design, 11: 2651
subcritical intersections for, empirical method for calculating, 11: 12509

Pipettes
dripless transfer, for radiochemical solutions, 11: 3736

PIPPA reactors
See Calder Hall Reactors.

Pitchblende deposits (Colo.)
geochemical exploration, 11: 1118(J)
occurrence in Wood and Wast Calhoun Mines, 11: 12045(J)

Pitchblende residues
See Radium cake; Uranium leach precipitates; Uranium leach residues.

Pitchblendes
(See also Uraninites.)
acid leaching and flotation, 11: 2380(R)
age estimation of Kalongw and Luishya, in the Belgian Congo, 11: 2906(J), 5318(J)
gravimetric determination of Cl in, 11: 2400
lead–uranium ages, additional regularities among discordant, 11: 7998(J)
occurrence of Cl^{36} in Great Bear Lake, 11: 5952(J)
organic leaching, 11: 12376(R), 13031
paragenesis and structure of, in vein deposits in Central City, Colo., district, 11: 3826(J)

Pitchblendes (cont'd)
petrological examination for relation of content to residue filterability, 11: 12358
processing for Mo recovery, 11: 12971(R)
processing for U and Ra recoveries, 11: 8385
radiochemical analysis for Ra, ionization chamber for, 11: 12971(R)
resonance capture of neutrons in, 11: 3407(J)
spectrographic analysis for aluminum, silicon and calcium, 11: 12971(R)
spectrophotometric analysis for U_3O_8, 11: 10812(R)
uranium content of sulfide minerals associated with, 11: 4440(R)

Pitot tubes
pressure, at mouth relation to pressure in the manometer, 11: 2426

Pittsburgh. Univ.
progress reports, 11: 5370(R)
progress reports on application of chemical thermodynamics to study alloy formation, 11: 2920(R), 3423(R)
progress reports on thermodynamic properties of Mg–Cd compounds, 11: 4462(R)

Pituitary gland
proton irradiation effects on human, 11: 9973(J)
radioinduced ablation, preparation of Y^{90} seeds for, 11: 1758(J)
radiosensitivity, 11: 12961(R), 13566(R)
radiosensitivity in frogs, 11: 4790(J)

Pituitary hormones
influence on reticulo-endothelial uptake of colloidal thorium, 11: 5713(J)
role in blood regeneration after radiation injury, 11: 3274(R)

Placental tissues
x-ray effects on penetrability of, at different periods of pregnancy in rabbits, 11: 13235(J)

Placer deposits
geology, mineralogy, and prospecting, in Alaska and northwestern, western, and southeastern U.S., 11: 3825

Placer deposits (Idaho)
geology and occurrence in Boise Basin, 11: 4865
occurrence in Bear Valley District, radiometric and petrographic analysis, 11: 3821
occurrence in Beaver Creek Placer Area, 11: 3822
occurrence in Big Creek Placer Area, 11: 4437
occurrence in Camp Creek Placer Area, 11: 3824
occurrence in Corral Creek Placer Area, 11: 3823
occurrence in Pearsol Creek Area, 11: 4866
occurrence in Rock Creek Placer Area, 11: 4439
occurrence in Scott Valley and Horsethief Basin areas, 11: 4438

Placer deposits (N. C.)
occurrence in Sandy Run Creek Area, 11: 4436
occurrence in South Muddy Creek and Silver Creek areas, 11: 3404

Placer deposits (S. C.)
occurrence in Big Generostee Creek area and North and South Rabon Creek Areas, 11: 5315
occurrence in Broad River and Thicketty Creek Areas, 11: 4864
occurrence in Tygre River Placer Area, 11: 3820

Plankton
(See also Algae.)

Plankton (cont'd)

radiometric analysis of, collected near Bikini and Eniwetok Atolls following Operation Redwing, 11: 5965

radiometric analysis of, taken from Pacific Ocean after Castle Operation, 11: 878

Plant cells

metabolism in, effects of radiation, 11: 6611(J)

radiation effects, 11: 5144(J), 5170(J)

Plant diseases

radiosensitivity, 11: 17(J)

radiosensitivity of tobacco mosaic virus, 11: 24(J)

Plant metabolism

controlled-environment growth chamber for use in studies on, 11: 3322

of fission products after uptake from contaminated soil, 11: 10412

foliar sorption of I^{131}, 11: 3321

photochemical reactions, 11: 2777

tracer studies, 11: 12661

tracer studies employing P^{32}, 11: 5750(J)

Plant respiration

in seedlings from seed exposed to γ radiation, 11: 1740(J)

Plants

(See also Arco chemical plant; Electromagnetic separation plant; Gaseous diffusion plants; Naval reactor power plants; Nuclear aircraft power plants; Nuclear power plants; Power plants; Radiochemical processing plants; Steam power plants; Submarine power plants; Uranium ore processing plants.)

breeding, genetic factors, 11: 855(J), 5130

carbon dioxide absorption during photosynthesis, 11: 2254(R)

detection and measurement of radioactive isotopes of Sr, Cs, Ru, Zr, and Ce in, 11: 11048(J)

deuterium distribution, 11: 1407

effect of boric acid on, 11: 11047(J)

fission product absorption and accumulation by, 11: 897, 6223(J)

flower color changes following x irradiation of carnation clones, 11: 11846(J)

monitoring of fission particles following absorption from soil contaminated by radioactive fall-out, 11: 11082

physiology, research in U.S.S.R., 11: 8761(J)

radiation effects, 11: 855(J), 3657(J), 5155(J)

radioactivity levels in, of Rongelap and Ailinginae Atolls, Marshall Islands, after atomic explosions, 11: 9192

radioinduced mutations in, 11: 5753(J), 8762

radioinduced mutations in jute, 11: 11875(J)

radiometric analysis for I^{131} content, 11: 2240

radiometric analysis for Ru^{106}, 11: 8790(R), 8791(R)

radiometric analysis for Sr^{90}, 11: 3690, 6612, 6613, 7400(R)

rate of entry of Sr^{89} and Sr^{90} from the soil, 11: 11033(J)

toxic effects of chromium in, 11: 64

tracer studies on uptake and distribution of nutrients by, 11: 15(J), 17(J)

Plasma

(See also Blood plasma; Electric arcs.)

accelerator for, design of pulsed air-core betatron, 11: 7346

arc column deformation of, study with probe, 11: 1943(J)

atomic partition function and effective ionization potential in, 11: 5933(J)

bibliographies, 11: 12900

button-type source for production of plasmons, 11: 3453

Plasma (cont'd)

Cherenkov effect in electronic, in a magnetic field, 11: 6433(J)

confinement at uniform temperature, 11: 4515

constricted gas discharge, conductivity and ionization, 11: 11287(J)

contact phenomena, 11: 435(J)

containment by magnetic forces from cylindrical shields, 11: 5391

current contractions, 11: 431(J)

current distribution curve, effect of high and low current on, 11: 1943(J)

diffusion across a magnetic field, 11: 1215, 3899(J)

diffusion and ionization in microwave discharges, 11: 9365(J)

distribution function for electrons in, 11: 8049(J)

dynamical properties, Newtonian development, 11: 13376(J)

electroacoustic waves in gas discharge, role of space discharge in behavior, 11: 8057(J)

electromagnetic radiation from electron, 11: 5692(J)

electromagnetic waves propagated in, 11: 7228(J)

electron and positive ion energies in, probe for measurement, 11: 5935(J)

electron behavior in, 11: 8052(J)

electron concentration and number of collisions in gas discharge, determination method, 11: 8062(J)

electron densities, microwave measurements, 11: 6774(J), 6775(J)

electron-electron and ion-electron effective cross-sections in, 11: 10690(J)

electron motion in, effect of external inhomogeneous magnetic field on, 11: 8051(J)

emission of a glow discharge in moist air, 11: 8053(J)

equations of motion, 11: 7227

fields on ions in, evaluation of probability, 11: 4529(J)

gas oscillations in magnetic field, 11: 12782(J)

high-current discharge, theory of collapse of, 11: 4520(J)

high-current gas discharge in longitudinal magnetic field, 11: 8962(J)

high-frequency gas discharge in H, effect of static magnetic field, 11: 421(J)

hydromagnetic instabilities of ideally conducting fluid, 11: 4521(J)

hydromagnetic shock wave in, structure, 11: 428(J)

hydromagnetic waves in, relativistic study, 11: 7377(J)

ion and particle diffusion, 11: 1618(R)

kinetic theory of weakly ionized homogeneous, 11: 2957(J)

kinetics of, methods of theoretical investigation, 11: 12780

longitudinal oscillations in, nonlinear theory, 11: 5397(J)

losses by fast electrons in thin films, 11: 9367(J)

magnetic lines of force in, motion, 11: 7374

magnetohydrodynamic equations of motion in, 11: 8550

magnetohydrodynamic waves in, theory, 11: 12086(J)

mathematical analysis, 11: 1554

microwave diagnostics for high-temperature, 11: 10138

optimum conditions for highly ionized H_2, 11: 1920(R)

oscillation properties of electron, 11: 7229(J)

oscillations, 11: 427(J), 3900(J)

oscillations, criteria for self-excited, 11: 8048(J)

oscillations, dispersion relation and short wave length cutoff for, 11: 6771, 11290(J)

oscillations, effect of resonance frequency of generator, 11: 421(J)

oscillations, effects of boundary sheaths on, 11: 5369(R)

oscillations and probe measurements, 11: 2551

Plasma (cont'd)
oscillations in, mathematical analysis, 11: 5392, 11285, 11286
oscillations of cylindrical, at zero pressure in longitudinal magnetic fields, 11: 4527
oscillations of electron, 11: 8050(J)
particle orbits, 11: 12790
penetrating radiation from pulse discharges, 11: 432(J)
pinch effect, initial conditions for dynamic, 11: 10139
pinch effect in, review of studies, 11: 7234(J)
pinch effect theory, survey, 11: 2558
positive ion collection by probe immersed in, 11: 5396(J)
production, apparatus for, 11: 7039(P)
production of high-energy, by magnetically driven shock waves, 11: 11288(J)
production of high-temperature high-density, 11: 4913(J)
properties in transient condition, 11: 2958(J)
pulsation in cylinder, mathematical analysis, 11: 12781(J)
pulse discharge in H, spectroscopic studies, 11: 433(J)
pulse discharges at high currents, 11: 430(J)
radiation formula and application to controlled thermonuclear fusion, 11: 12102(J)
radiation temperature, 11: 426(J)
reflex discharges in hydrogen, 11: 9364
relaxation of a system of particles with Coulomb interactions, 11: 11289(J)
ring currents, possibility of producing relativistic self-constricted, 11: 6776
self-consistent field method for, 11: 8960
shock wave description in free particle hydrodynamics with internal magnetic fields, 11: 10137
space-time development of the light emission in the visible and infrared regions, 11: 422(J)
spectral density in Ar and Xe, 11: 422(J)
stability, electron loss, density and distribution, and diamagnetism in microwave maintained, 11: 13358(R)
stability, energy principle for hydromagnetic problems, 11: 12098, 12099
stability of, influence of conducting walls on, 11: 13370
stability of cylindrical gaseous conductor in a magnetic field, 11: 8963(J)
stability of pinched, with imposed longitudinal magnetic field, 11: 12506
stability relationships for plasmons, effect of polarized currents crossed with magnetic fields, 11: 3453
stability when confined by magnetic fields, 11: 8061(J)
statistical mechanics and oscillations, 11: 444, 9366(J)
striations, theory of, 11: 8961(J)
structure, experimental study, 11: 10607(J)
structure of steady hydromagnetic shock in, one-fluid theory, 11: 12758
temperature and radiation measurements on water-stabilized high pressure arcs, 11: 6773(J)
theory of, survey, 11: 2558
thermodynamical equilibrium of, emissive disturbance, 11: 5395(J)
time-dependent cylindrical, hydromagnetic flow for media with scalar conductivity, 11: 11284
velocity distribution function for elastic collisions of electrons with heavy particles in, 11: 436(J)
vibration properties, effect of gas molecules, 11: 1942(J)
wave propagation, 11: 8354(J), 9354(J)
Plasma (cont'd)
waves in cylindrical, 11: 8054(J)
waveguides, use as accelerating structures in linear accelerators, 11: 3185(J), 9497
Plaster castings
of irradiated fuel slugs, fabrication, 11: 7221
Plastic coatings
radiation damage, 11: 1374
radiation effects and properties, 11: 13735
Plastic deformation
chemical effects at high pressures, 11: 13262(J)
Plastic-film detectors
performance for x-ray dosimetry, 11: 10181(J)
Plastic flow
(See also Fluid flow.)
boundary layer, mathematical analysis, 11: 243(J)
Onsager's principle and its significance for rheological problems, 11: 7165
theory, redeveloped, 11: 4888
Plastic fuel tapes
See Reactor fuel tapes.
Plastics
(See also Ethylene polymers; Laminates; Loaded plastics; Styrene polymers.)
casting in plastisol molds, 11: 2444
corrosion by hydrofluoric acid, 11: 12459
corrosion resistant fibrous web or fabric, 11: 7391(P)
cryogenic data, 11: 386
electric and mechanical properties of laminated, radiation effects on, 11: 4741
gamma radiation effects on mechanical, optical, and thermal properties, 11: 6150
high-temperature properties of glass-reinforced, 11: 11256
insulators, transient electric currents, 11: 425
optical properties of lucite, radiation effects on, 11: 7456(R)
radiation damage to mechanical properties, method of measurement, 11: 12929
radiation effects, 11: 171(J), 1922(R), 3358(J), 4161, 5246, 5808, 5813(J) 7826(R), 7885, 8705(R), 9747(R), 8857, 13597(R)
radiation effects on power cable insulation type, 11: 13629
radiation effects on structural, 11: 11108
resistance to chemical attack by Dapex and Amex solutions, 11: 3359(R)
scintillation behavior, 11: 2026(R)
test section fabrication from epoxy resin, 11: 12724
thermal neutron diffusion lengths, 11: 13885(R)
uses in high-energy nuclear research, 11: 3442
Platelets
See Blood platelets.
Plates
(See also Reactor fuel plates.)
buckling, 11: 11152, 11154
buckling of composite elements, 11: 11151
buckling of flat, 11: 11150
creep, variational theorem for, 11: 8005
failure of, and composite elements, 11: 11153

Plates (cont'd)

free convective cooling of parallel vertical, 11: 8439

heat transfer from heat producing, mathematical analysis of thermoelastic stability, 11: 13713

heat transfer in finite, with constantly varying temperature, 11: 6327

natural convection heat transfer from inclined, interferometric studies, 11: 11164

radiation from neutron-activated, calculations, 11: 6043(J)

residual stress in, graphical method, 11: 10566

stress analysis and failure, 11: 2545

temperature distribution and thermal stresses, 11: 13046

thermal stresses in thin, with spanwise and cordwise variations of temperature and thickness, 11: 10517

transient temperatures and thermal stress in, 11: 9757

Plating

(See also Coatings; Electrochemistry; Electroplating.)

vacuum deposition, design of holder for spheres and cylinders for, 11: 12455

Platinum

alpha activity induced by bombardment with nitrogen ions, 11: 3099(J)

anodes, effects of HF on, 11: 7494

colorimetric determination in U–Zr alloys, 11: 3698

corrosion by aqueous reactor fuel solutions, 11: 8449

corrosion by high temperature high purity H_2O, 11: 2903(J)

corrosion by UO_2SO_4 and mineral acids, 11: 9869(R)

corrosion in Thorex solutions, 11: 7487

Coulomb excitation of, angular distribution of γ rays from, 11: 8157(J)

determination in Pt–U alloys, 11: 3341

nuclear evaporation induced by cosmic rays in, studied with emulsion sandwich, 11: 3530(J)

polarographic determination in Pu-bearing solutions, 11: 12346

proton inelastic scattering and (p,d) reactions, energy distributions, 11: 9495(J)

radiometric analysis for trace amounts of Po, 11: 1775

scattering of fast electrons, 11: 756(J)

self-diffusion in polycrystalline, 11: 10225

wettability by molten sodium silicate, 11: 1543(R), 13332

Platinum–cobalt alloys
See Cobalt–platinum alloys.

Platinum complexes

absorption spectra of aminohalides, nitrohalides, and nitroamines, 11: 11923(J)

Platinum compounds

crystal structures of $Pt(NH_3)_4\ PtCl_4$, 11: 9237(J)

synthesis of ethylenediamineplatinum(II) and (IV) bromides and iodides, 11: 10044(J)

Platinum–iridium alloys
See Iridium–platinum alloys.

Platinum isotopes

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

neutron cross sections, 11: 7713

Platinum isotopes Pt^{191}

radiation from, 11: 10357(J)

Platinum isotopes Pt^{192}

energy levels studied by radioactivity of Ir^{192}, 11: 6050(J)

radiation from, and proposed decay scheme, 11: 10357(J)

Platinum isotopes Pt^{193}

level scheme, 11: 7313(J)

Platinum isotopes Pt^{194}

Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

energy levels, 11: 4035(J)

neutron scattering data, 11: 10229

Platinum isotopes Pt^{199}

decay schemes, 11: 3054(J)

Platinum isotopes Pt^{200}

identification and decay properties, 11: 4928(J)

Platinum metal–uranium alloys

constitution diagrams, 11: 4464(R)

Platinum metals

spectrographic determination in Al, 11: 3336

Platinum–molybdenum–uranium alloys
See Molybdenum–platinum–uranium alloys.

Platinum–niobium–uranium alloys
See Niobium–platinum–uranium alloys.

Platinum–uranium alloys

analysis for Pt and U, 11: 3341

constitution diagrams, 11: 4464(R)

thermal analysis, 11: 13042

Plax Corp., Hartford, Conn.

progress reports on packaging materials, 11: 1413(R), 1414(R)

PLUTO
See DIDO.

Plutonium

absorption from the gastrointestinal tract, 11: 8261(R)

absorption on metals, 11: 7859(R), 9869(R)

adsorption methods for separation, 11: 7516(R)

adsorption on silica gel and $Zr_3(PO_4)_4$, 11: 13024(R)

amalgam electrode potentials, 11: 4387

analytical methods for, 11: 10839

atomic spectra, 11: 7153(J)

behavior in uranyl sulfate solution, 11: 9617(R)

capture-to-fission ratio experiments, thickness of B^{10} shield for, 11: 14035

capture-to-fission ratios, 11: 2739

chemical properties and determination, 11: 2831

chemistry in Bismuth Phosphate Process, 11: 7515(R)

colorimetric determination with Thoronol, 11: 4282

composition of re-irradiated, 11: 4553

coprecipitation of Pu^{4+} with $BiPO_4$, 11: 7420

coulometric determination, 11: 2825, 13272(J)

critical mass for cylindrical geometry, 11: 13107

criticality studies, 11: 13965

crystal structure of, 11: 1014(J)

cutaneous absorption from PuF_4 solution, 11: 11877(R)

decontamination by fused-salt electrorefining, 11: 10472

decontamination by precipitation of phosphate using Bi carrier, 11: 7010(P)

decontamination by precipitation with LaF_3, volatilization, and fluorination, 11: 7009(P)

decontamination from fission products by adsorption methods, 11: 11619

Plutonium (cont'd)
decontamination of human skin after immersion in solutions of, 11: 11037
determination, 11: 10803(R), 13247
determination, procedures for, 11: 1
determination, tracer scale, 11: 3772
determination in presence of Al, 11: 7438, 10825
determination in Purex Process streams, 11: 11585
determination in separation process solutions, 11: 3696
determination in uranium recovered by Redox Process, 11: 13671
determination of, in fluoride volatility samples, 11: 13580(R)
determination of Am in presence of, 11: 9595
diffusion into U, 11: 12483
distillation and molten salt extraction, 11: 8388(R)
distillation in F_2, 11: 7418(R)
distribution coefficients of Pu^{4+} in Redox Process solutions, 11: 12371
distribution of fission products and, between molten U and UF_3-BaCl_2 mixtures, 11: 6308(J)
economic aspects, 11: 14(J)
electrodeposition of thin films, 11: 7562, 8836(J)
electron energy levels and nuclear spin, 11: 1289
electron energy states, 11: 8942(R)
energy band structure calculations, 11: 7889(R)
energy band structure of metallic phases, 11: 6770
evaporation from liquid surface to gas, 11: 12483
extraction and decontamination processes for, 11: 11620(R)
extraction from K-25 pot residue, 11: 7485(R)
extraction with molten metals, 11: 6308(J)
fission cross section ratio to U^{235}, 11: 11745(R)
fission product gas removal by charged wire technique, 11: 11599
fluorination and separation from U, 11: 12374
fluorination with CaF_3, 11: 11620(R)
fused salt extraction from U, 11: 8387(R)
gasometric analysis for H_2, N_2, and O_2, 11: 3339
gravimetric determination in Pu compounds, 11: 4287
handling, design of glove boxes, 11: 9246(J)
ion exchange behavior, 11: 986, 3702
ion exchange separation from UNH, progress reports, 11: 7517(R)
liquid metal and molten salt extraction from U and U–Zr alloys, 11: 7543(R), 7544(R)
liquid metal extraction using Mg, 11: 9580(R)
lung burden determined by urine analysis, 11: 12659(J)
magnetic susceptibility of, from 20 to 350°C, 11: 5911
metabolism and pathological effects in dogs, 11: 5133(R), 11019(R)
metabolism in lab animals, 11: 8257(R)
metabolism in rats, 11: 2242(R)
metal production from turnings, safety considerations, 11: 13793
metallurgy, handling, and physical properties, 11: 3773(J)
molten salt extraction of, flow sheets for, 11: 9835
neutron total cross sections, 11: 7690(R)
nuclear properties, 11: 13834(R)
occurrence in nature, 11: 12341(R)
oxidation, kinetics, 11: 13564(R)
Plutonium (cont'd)
oxidation in aqueous solutions, effect of deuterium content on, 11: 5281(J)
oxidation-reduction chemistry, 11: 7534
oxidation-reduction reactions in process solutions, 11: 8361(R)
performance of a reflux solvent extraction system, 11: 11997
permissible limits in air, 11: 892, 10806, 12809
physical properties and production, 11: 10838(R)
polarographic behavior, 11: 12346
preparation and properties of colloidal Pu^{4+}, 11: 211(J)
process for concentrating in dilute solutions, 11: 5091(P)
processing, cost analysis, 11: 6890
production by conversion of plutonium nitrate, 11: 11976
production in homogeneous reactors, 11: 9847
production in reactors, 11: 8707(R)
production in reactors, graphical method of analysis, 11: 9762
production in reactors, rate calculations, 11: 9481(J)
production in Shippingport Pressurized Water Reactor, 11: 13864(R)
production in Sodium Reactor Experiment, 11: 12575(R)
production rate and cost factors for MTA targets, 11: 10996(R)
production rates in D_2O-UO_3 and H_2O-UO_2 slurry reactors, 11: 8589
purification by solvent extraction with thenoyltrifluoroacetone, 11: 13296(J)
purification in Bismuth Phosphate Process, manual on, 11: 7464
pyrochemical transfer of, from spent to fresh U, 11: 7547
pyrophoricity, 11: 2934(J)
radiochemical properties, 11: 2367
radiometric determination, 11: 12809, 12973(R)
radiometric determination by α counting, comparison of detectors for, 11: 4564
radiometric determination following precipitation from urine, 11: 2243(R), 5214
radiometric determination following separation from air, 11: 5714
radiometric determination of small amounts on filter paper, 11: 10443
reaction kinetics in D_2O power breeder reactor, 11: 8678
reactivity value for, in thermal reactors, 11: 4090
recovery by the fluoride volatility process, 11: 11564(R)
recovery from irradiated U by CTF Process, 11: 8379
recovery from spent homogeneous reactor fuel, survey, 11: 11603
recovery from spent reactor fuels, 11: 8868
recovery in horizontal countercurrent extractors, 11: 12407
reduction by U^{4+}, 11: 6693(J)
removal from solutions by ion exchange, remote device for, 11: 9540(P)
separation and analysis of, produced in EBR, 11: 9784
separation by adsorption, 11: 11620(R)
separation by chromatographic method, decontamination, and recovery, 11: 8402
separation from Al by precipitating $La(OH)_3$ by NaOH, 11: 10825
separation from Am in HNO_3 solutions, 11: 4358
separation from fission products, 11: 5098(P), 8877(J), 13288
separation from irradiated U by ion exchange, 11: 7521
separation from molten U by scavenging with solid U oxide, carbide, and nitride, 11: 8389

Plutonium (cont'd)

separation from Np, 11: 13577(R)

separation from neptunium by chloride distillation, 11: 7466

separation from Purex Process IIBP streams by ion exchange, 11: 8334

separation from U, by liquid Mg extraction, 11: 7407(R)

separation from U and fission products, 11: 1005(J), 3228(P), 3233(P), 5094(P), 6583(P), 8867

separation from U and fission products by coprecipitation with $BiPO_4$, 11: 11514(P), 11515(P), 11516(P)

separation from U by distillation, fused fluoride extraction, and oxide scavenging, 11: 7542(R)

separation from U by ion exchange, 11: 5271(J)

separation from U by liquid Mg and fused F^- extractions, 11: 7545(R)

separation from U by Mg extraction, 11: 7408(R), 7973(J), 9581(R), 13680(R)

separation from U by volatilization, 11: 7541

separation (LaF_3 method), effect of Ni, Cu, and K ions on, 11: 7418(R)

separation of Np from, in Hanford waste solutions, 11: 7467

separation processes for irradiated fuels, 11: 6314(J)

solubilities in uranyl salt solutions and chemistry, 11: 7857(R)

solubility, 11: 11563(R), 12584(R), 13985(R)

solubility and hydrolysis in UO_2SO_4 solutions, 11: 13656(R)

solubility in aqueous uranyl sulfates, 11: 13661(R)

solubility in homogeneous reactor fuel solution and water, 11: 12898(R)

solubility in $UO_3-H_3PO_4-H_2O$ solutions, valence changes in γ irradiated solutions, adsorption on stainless steel, and chemistry in UO_2SO_4, 11: 12585(R)

solubility in uranyl sulfate solution, effect of O on, 11: 9617(R)

solvent extraction, 11: 7534, 9662, 10838(R), 13837(R)

solvent extraction by trifluoroacetylacetone of Pu^{4+}, 11: 12369

solvent extraction chemistry, 11: 11600

solvent extraction concentration and isolation with hexone, 11: 7522(R)

solvent extraction determination using TTA in benzene, 11: 9598

solvent extraction from chloride solution and decontamination, 11: 13581(R)

solvent extraction from fluoride volatility processes residue, 11: 8342

solvent extraction from irradiated U with TBP–kerosene solution, 11: 1477

solvent extraction from ORNL metal wastes by Purex Process, 11: 12401

solvent extraction from process solutions, 11: 3367(J)

solvent extraction from reactor solutions with TBP, 11: 13639(R)

solvent extraction in chelate process, 11: 13023

solvent extraction in Purex Process, 11: 11604

solvent extraction with hexone from 1AF solutions, 11: 8368(R)

solvent extraction with organo-phosphorus compounds, 11: 9663

solvent extraction with TBP, effect of hydrolysis on, 11: 9661

solvent partition, 11: 10823

solvent partition between hexone and $HNO_3-Ca(NO_3)_2$ solutions, 11: 6685(J)

solvent partition in butex and TBP, 11: 4359

solvent partition on Dowex in H_2SO_4, 11: 8288(R)

specific activity and isotopic content determination, 11: 3692

specific heat of alpha, 11: 4447

spectra, 11: 9579(R)

spectra and energy levels, 11: 3935(R)

Plutonium (cont'd)

spectrographic determination, 11: 7107, 7407(R)

storage, comparison of homogeneous and heterogeneous, 11: 4612

thermal expansion coefficient of alpha, 11: 1523, 12413

thermal expansion of δ, δ', and ϵ, 11: 1014(J)

thermal fission, neutron multiplication factor, 11: 590(J)

tissue distribution and excretion in man and in rats, 11: 2244

tissue distribution following injection in rats, effects of Zr salts, 11: 5754(J)

toxicology, 11: 893

valence state analyses in Redox streams, 11: 8380(R)

vaporization at 700°C in HF-air mixture, 11: 10489

volatilization and liquid metal and molten salt extractions from irradiated U and Th–U alloys, 11: 7546(R)

volatilization from molten U, 11: 8386(R)

volume expansion of cubic phase in, negative coefficient of, 11: 1172(J)

properties of $Pu(C_5H_7O_2)_4$, 11: 10838(R)

Plutonium alloys

analysis for Mo, 11: 2865(J)

crystal structure, x-ray-diffraction analysis, and phase diagrams, 11: 3773(J)

spectrophotometric analysis for Zr, 11: 5784(J)

thermal expansion from 20 to 500°C, 11: 11689(R)

Plutonium–aluminum alloys

See Aluminum–plutonium alloys.

Plutonium arsenides

crystal structure, 11: 4512(J)

Plutonium butyl phosphates

preparation and solubility as a function of time, temperature, HNO_3 and MBP concentration, 11: 7563

Plutonium chelates

preparation and chemical properties, 11: 2367

stability of Pu^{3+}, Pu^{4+}, and Pu^{6+} with ethylenediaminetetraacetic acid, 11: 7117(J), 7118(J)

Plutonium chlorides

chemical and physical properties, 11: 5282

Plutonium complexes

with chlorides, absorption spectra, 11: 11138(J)

formation for Pu extraction, 11: 7418(R)

Plutonium compounds

chemical properties, 11: 8360(R)

crystal structure, 11: 8541(R)

gravimetric analysis for Pu, 11: 4287

preparation of Pu alkoxides, 11: 10493(J)

temperature effects on, 11: 3771

Plutonium films

preparation by electrodeposition, 11: 7562

preparation of thin Pu^{239} sources by adsorption on glass, Al, and Pt surfaces, 11: 10113(J)

Plutonium fluorides

dissolution and fusion by various means, 11: 4383

formation by passing F_2 over Pu–U in a reactor, mathematical analysis, 11: 13684

preparation, handling, and thermal stability, 11: 7408(R)

Plutonium(III) fluorides

production by hydrofluorination of plutonium oxide or plutonium oxalate, 11: 10489

solubility in HNO_3–HF and solubility product, 11: 4386

Plutonium(IV) fluorides

criticality studies, radii of spheres and infinite cylinders, 11: 13686

fluorination with F gas at atmospheric pressure, 11: 13582(R)

preparation by reaction of BrF_3 with $Pu(IO_3)_4$, 11: 13576(R)

production by hydrofluorination of plutonium oxide or plutonium oxalate, 11: 10489

reactions with BrF_3, 11: 11564(R)

reactions with dry O_2 above 700°C, 11: 4385

solubility in CTF Process solutions, 11: 8379

solubility in HNO_3, 11: 3770

Plutonium(VI) fluorides

conversion to sulfate by concentrated H_2SO_4, 11: 11496(P)

criticality studies, radii of spheres and inifinite cylinders, 11: 13686

preparation, properties, and spectra, 11: 8401

radiometric determination, 11: 12811

separation from UF_6, 11: 9581(R)

thermal decomposition as a function of temperature, prefluorination, and atmosphere, apparatus for, 11: 13582(R)

Plutonium foils

preparation, 11: 13085

Plutonium hydroxides

reactions of $PuO_2 \cdot xH_2O$ with HBr at 700°C, 11: 10838(R)

Plutonium ions

beams, effects on electron emission from W filaments, 11: 7405(R)

colloidal formation in dilute HNO_3 solutions, 11: 211(J)

distribution coefficients of Pu^{4+} and Pu^{3+} in TTA–C_6H_6–HNO_3 system, 11: 7431

separation with ThP_2O_7 and zirconium phenylarsonates, LaF_3, Nb_2O_5, 11: 3772

Plutonium(III) ions

determination in solution, 11: 2366

isotopic exchange between, and Pu(IV) ions in aqueous perchlorate media, 11: 11139(J)

oxidation to Pu^{4+} by O_2 in H_2SO_4 solutions, 11: 1015(J)

Plutonium(IV) ions

determination in solution, 11: 2366

hydrolysis, 11: 10491(J)

isotopic exchange between, and Pu(III) ions in aqueous perchlorate media, 11: 11139(J)

oxidation in UNH solutions under various conditions, 11: 13685(R)

Plutonium(V) ions

catalytic disproportionation, 11: 12330(R)

Plutonium(VI) ions

reduction in UNH solutions by various reducing agents, 11: 13685(R)

Plutonium isotopes

chemical effects on tissues and metabolism in animals, 11: 7055(J)

delayed neutrons from fissionable, 11: 13456(J)

deuteron-induced spallation and fission reactions in Pu^{238} and Pu^{240}, 11: 3579

electromagnetic separation of Pu^{239} to Pu^{242}, 11: 6452(J)

formation from irradiation of Pu^{239}, 11: 10780

helium-ion induced reactions, spallation-fission competition, 11: 1351(J)

Plutonium isotopes (cont'd)

mass spectrometric analysis, effect of O_2 isotopes when using PuO_2 ion beams, 11: 5773

neutron cross sections, 11: 590(J), 10229

neutron cross sections, calculation methods, 11: 8267(R)

nuclear properties, 11: 11728(R), 13443

thermal neutron cross sections, review, 11: 10245

production in reactors, effect on reactivity, 11: 4979(J)

spontaneous fission energy release, calculated, 11: 13444

Plutonium isotopes Pu^{233}

decay properties, 11: 10260(J)

formation by $U^{233}(\alpha,4n)$ reaction with 45 Mev He ions, 11: 3330(R)

Plutonium isotopes Pu^{235}

decay properties, 11: 10260(J)

Plutonium isotopes Pu^{236}

half life by direct decay method, 11: 9075(J)

production from deuteron bombardment of U, 11: 13202

Plutonium isotopes Pu^{237}

alpha decay in, 11: 11481(J)

decay properties, 11: 10260(J)

decay schemes, 11: 12268

Plutonium isotopes Pu^{238}

energy levels, 11: 9579(R)

gamma decay, 11: 2077(J)

half life, 11: 12714(J)

neutron capture cross sections, 11: 4976(J), 13575(R)

production from deuteron bombardment of U, 11: 13202

production from U^{238}, 11: 2142(J)

Plutonium isotopes Pu^{239}

absolute fission yield of Cs^{137} by fast neutron, 11: 9581(R)

absorption and fission cross sections, calculations, 11: 12504(R)

breeding ratio in U–H_2O lattices, 11: 678(J)

build-up of Pu isotopes in irradiation of, 11: 10780

capture-to-fission ratio, in the EBR-I, 11: 13513(J)

capture-to-fission ratios, 11: 550(R), 2026(R), 11359, 13857, 13965

Coulomb excitation, γ rays from, 11: 8144(J)

criticality of aqueous solutions, 11: 1618(R)

cross sections, α, η, ν, and Γ, 11: 10244

cross sections and multiplication factor, 11: 9440

decay scheme and electron spectra, 11: 4062(J)

delayed neutron emission from fission, 11: 11782

delayed neutrons from fast fission, 11: 3552, 4985(J)

detection by neutron irradiation, 11: 3769

deuteron reactions and fission-spallation competition from Am^{241}, 11: 3578

energy levels, 11: 2066(J), 5533, 6049(J)

evaporation of atoms from surface of, on emission of fission fragments or α particles, 11: 5524(J)

for exponential studies, accountability, security, and health physics procedures for handling, 11: 8546

fast fission, yield of Cs^{137}, 11: 11309(J)

fast fission of, fission product yields from, 11: 10719

fission and neutron resonance parameters, 11: 12196(J)

Plutonium isotopes Pu^{239} (cont'd)

fission cross sections in neutron energy range 30 kev to 5 Mev, 11: 12200(J)

fission in EBR, 11: 7690(R)

flux and power distribution and reactivity in MTR using, 11: 13495

half life and fast neutron fission cross sections, 11: 11564(R)

internal conversion coefficient, 11: 2027(R)

neutron cross sections, 11: 8141

neutron cross sections, 2200 m/sec, 11: 11357

neutron cross sections and their temperature dependence, 11: 9442

neutron fission cross sections, 11: 550(R), 590(J), 622(J), 712(J), 1275(R), 1618(R), 1654(J), 2065(J), 2116(R), 4034, 6010, 6863(R), 7311

neutron fission cross sections, normalization, 11: 8116(R)

neutron fission cross sections in the energy range 0.030 Mev to 3.0 Mev, 11: 11387(J)

neutron lifetime in, 11: 12854

neutron scattering from, 11: 1683(J), 2064(J), 2116(R)

neutron total cross sections, 11: 13430(R)

neutrons emitted in single capture event for, 11: 621(J), 713(J), 714(J)

neutrons emitted per fission induced by thermal and fission neutrons, 11: 12077(J)

nuclear properties, 11: 11493

permissible limits, revisions in computation, 11: 2234

photoneutron emission, 11: 6547(J), 10319(J)

production rates in NRX Reactor, 11: 3076

reactivity changes in thermal reactors from U^{238} conversion, 11: 13865

reactivity effects in EBR, 11: 10923(R)

separation of, by electromagnetic means, 11: 13114(R)

temperature coefficient of regeneration factor η, 11: 10923(R)

thermal neutron absorption and fission cross sections, 11: 9776

Plutonium isotopes Pu^{240}

alpha spectra, 11: 3604(J)

effective capture cross section of, for reactor neutrons, 11: 10254(J)

fission cross sections in neutron energy range 30 kev to 5 Mev, 11: 12200(J)

formation in EBR, 11: 7690(R)

neutron absorption cross section and resonance integral, 11: 12196(J)

neutron capture cross sections, 11: 8267(R)

neutron cross sections, 11: 10244, 13965

neutron fission cross sections, 11: 1618(R), 2116, 5493(R), 5534

neutron resonance cross sections, 11: 12888(R)

neutron resonances, 11: 550(R), 621(J)

production in homogeneous reactors, 11: 8678

radiometric determination by spontaneous fission counting, 11: 2626

Plutonium isotopes Pu^{241}

beta spectra, 11: 3607(J), 4062(J)

cross sections, α, η, ν, and Γ, 11: 10244

neutron capture cross sections, 11: 8267(R)

neutron fission cross sections, 11: 1618(R), 4034

neutron fission cross sections, normalization, 11: 8116(R)

neutron-induced fission, 11: 8195(J)

Plutonium isotopes Pu^{242}

fission modes, 11: 8195(J)

Plutonium isotopes Pu^{242} (cont'd)

neutron capture cross sections, 11: 4976(J), 11563(R)

neutron cross sections, 11: 6036

Plutonium isotopes Pu^{243}

decay schemes and half lives, 11: 11563(R)

Plutonium–molybdenum–uranium alloys
See Molybdenum–plutonium–uranium alloys.

Plutonium–nickel alloys
See Nickel–plutonium alloys.

Plutonium nitrate–nitric acid systems
See Nitric acid–plutonium nitrate systems.

Plutonium nitrates

colloidal formation in dilute HNO_3 solutions, 11: 211(J)

crystallographic data for $Pu(NO_3)_4 \cdot 5H_2O$, 11: 1451

preparation, stability, and absorption spectra of Pu^{3+}, Pu^{4+}, and Pu^{6+}, 11: 5280

reduction in preparation of Pu metal, 11: 11976

solubility of $Pu(NO_3)_4$ and $Pu(NO_3)_6$ in butex, 11: 4382

solvent extraction using TBP, 11: 11136(J)

Plutonium(IV) nitrates

distribution coefficients of Pu^{4+} in Redox Process solutions, 11: 12371

solubility in TBP, TBP-kerosene, and ethanol, 11: 4384

Plutonium oxalates

decomposition by intrinsic α radiation, 11: 173

solubility in water and $(NH_4)_2 C_2O_4$ solutions, 11: 4382

Plutonium oxide–uranium oxide systems

sintering, 11: 12000(R)

Plutonium oxides

dissolution and fusion by various means, 11: 4383

formation in UO_2 drossing of irradiated U, equilibrium constants and free energy values, 11: 5260

hydrofluorination for preparation of PuF_3, 11: 10489

vapor pressure between 1400 and 1800°C, 11: 8277(R)

Plutonium(IV) oxides

precipitation from UO_2SO_4, 11: 7859(R)

precipitation in D_2O, 11: 8678

precipitation rate and separation with hydroclone, 11: 9869(R)

reactivity and refractive index, 11: 12414

spectral determination of Cd, Zn, Tl, Sb, Bi, Ni, Ba, Na, and K by evaporation in, 11: 7119(J)

Plutonium phosphides

crystal structure, 11: 4512(J)

Plutonium powders

explosive limits, handling, safety, and toxicology, 11: 6741

Plutonium Power Breeder Reactor
See KAPL Plutonium Power Breeder Reactor.

Plutonium production reactors
See Production reactors.

Plutonium Recycle Reactor Experiment

control requirements, 11: 10954

development of materials and equipment for, 11: 11410(R)

economic aspects, feasibility, and facilities, 11: 12229

fuel element dimensions, calculations, 11: 12885

kinetic behavior of system, 11: 10284

mathematical analysis of kinetic behavior, 11: 12887

Plutonium selenides
crystal structure, 11: 4512(J)

Plutonium–silicon systems
properties as shim rods in fast reactors, 11: 13094

Plutonium sulfates
preparation and chemical stability, 11: 12584(R)
preparation by passing PuF_4 into H_2SO_4, 11: 11496(P)
reaction with O_2, effect of D_2O on rate, 11: 5281(J)

Plutonium tellurides
crystal structure, 11: 4512(J)

Plutonium–titanium alloys
colorimetric analysis for Ti, 11: 5783(J)

Plutonium–uranium alloys
criticality studies, 11: 8685(R)
distillation, 11: 7541
fluorination, 11: 13581(R)
physical properties, 11: 10887(R)
radiation effects, 11: 7629(R), 8462(R), 10048
thermal expansion of alpha extruded, 11: 8462(R)

Plutonium–uranium–water systems
critical mass, 11: 4013(R)
kinetic behavior, 11: 10284

Plutonium–uranyl sulfate systems
chemical properties, 11: 10292
properties, 11: 13982(R)

Plutonium–zirconium alloys
spectrophotometric analysis for Zr, 11: 5784(J)

Plutonyl ions
electronic structure and magnetic properties, 11: 1836(J)

Pneumatic pulse generators
See Pulse generators (pneumatics).

Pocket chambers
development of ionization, for estimating β dose, 11: 7264

Poison columns
See Reactor control rods.

Poland
power research, ship propulsion, and use of radioisotopes, Russian assistance, 11: 1719(J)

Polar Mesa Camp District (Utah)
preliminary geologic map, 11: 10544(J)

Polarographs
calibration and improvement of Sargent, 11: 12330(R)
modification for rapid precision, and automatic instrument, 11: 1223(J)
operation of square wave, 11: 6780
recording-, design, 11: 1420(J), 3905
square-wave, description, operation, and uses, 11: 5209

Polarography
alternating current, potentials and theory, 11: 9982
alternating square-wave technique for, 11: 924
bibliography on, from 1922 to 1955, 11: 11946(J)
commutator method vs. direct compensation method for fused salt, 11: 1420(J)
equipment for determination of transfer coefficients for electrochemical reactions, 11: 11911
equipment for single-drop, 11: 6251
influence of non-uniform Hg flow and intermittent polarization on diffusion current, 11: 5774
of phenyl ketones, cause of prewaves and postwaves, 11: 9231(J)
square-wave, organic adsorption-desorption waves, 11: 5775
studies of Ag and Pa complexes and UO_2CO_3 solutions, 11: 12330(R)
theory of concentration, 11: 12671(J)

Poliomyelitis
modifications produced by in vitro irradiation of virus before inoculation into rats, 11: 5715(J)

Pollen
effect of boric acid on germinating, 11: 11047(J)
effects of exposure to γ radiation on crosses between L. perenne and F. pratensis, 11: 855(J)
radiosensitivity effects on whole-body x irradiation of peritoneal fluid cells and peripheral blood leukocytes in rats, 11: 11871(J)

Polonium
biological half life, 11: 13570
colloids, properties, 11: 94(J)
distillation from liquid bismuth, 11: 11979
ion exchange, 11: 6687(J)
maximum permissible single and multiple dosage, 11: 56(J)
metabolism, 11: 109, 2245(R), 4802
metabolism of, administered by intravenous injection into man, mouse, rat, dog, and rabbit tracer study, 11: 9975
molecular spectra, vibrational analysis, 11: 4004, 6166(J)
pathological effects, 11: 1405, 4802
phase studies, α to β transition temperature, 11: 7098(J)
precision plating, 11: 3344(J)
preparation by decomposition of PoS, 11: 6403(J)
radiation effects of α-particles from radioactive decay, 11: 11473(J)
radiometric determination in tissues and urine, 11: 109
radiometric determination in urine, 11: 13570
radiometric determination of trace amounts in Pt, 11: 1775
separation from bismuth by fused NaOH extraction, 11: 8387(R)
separation methods, properties, and compounds, 11: 7093(J)
solvent extraction, 11: 6687(J), 9662
solvent extraction from HCl solution by dithizone, 11: 5274(J)
status of Po–Bi distillation unit, 11: 11917

Polonium–beryllium alloys
See Beryllium–polonium alloys.

Polonium–bismuth alloys
See Bismuth–polonium alloys.

Polonium–calcium alloys
See Calcium–polonium alloys.

Polonium compounds
existence of Cs_2PoI_6, 11: 1786(J)
preparation and properties of $Po(SO_4)_2$, $2PoO_2 \cdot SO_3$, and $2PoO_2 \cdot SeO_3$, 11: 1425
solubility in water, 11: 8944(J)

Polonium iodides
preparation, properties, and crystal structure, 11: 95(J)
alpha decay energies, 11: 2254(R)

Polonium isotopes (cont'd)

chemical effects on tissues and metabolism in animals, 11: 7055(J)

energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

thermal neutron cross sections, review, 11: 10245

Polonium isotopes Po^{202}

alpha decay-electron capture ratios, 11: 6551(J)

Polonium isotopes Po^{208}

conversion electrons and γ radiation from decay, 11: 10255(J)

Polonium isotopes Po^{210}

decay scheme, branching ratio in, 11: 1693(J), 5560(J)

tissue distribution following intratracheal administration to rabbits, 11: 2808

tissue distribution in man, mouse, rat, dog and rabbit, 11: 9975

Polonium isotopes Po^{212}

energy levels, spins and parity, 11: 11373(J)

gamma spectrum studied by scintillation spectrometer, 11: 2072(J)

Polonium isotopes Po^{214}

internal conversion coefficients for M1 transitions, 11: 4174(J)

radiometric determination, 11: 10811(R)

transition zero → zero, theory, 11: 3612(J)

Polonium isotopes Po^{215}

alpha spectra and decay scheme, 11: 12933

Polonium isotopes Po^{218}

radiometric determination, 11: 10811(R)

Polonium–magnesium alloys
See Magnesium–polonium alloys.

Polonium–nickel alloys
See Nickel–polonium alloys.

Polonium sulfides

decomposition for preparation of Po, 11: 6403(J)

Polymerization

of acrylamide, effect of $Fe(ClO_4)_3$ on x- and γ-ray initiated reaction, 11: 6279(J)

of gamma-irradiated polymethyl methacrylate, 11: 172(J)

of ketones with halogenated butadienes, 11: 2844(R)

radiation effects, 11: 8857

radioinduced, 11: 6280

radioinduced, calculations of γ dose for, 11: 1467

radioinduced, of liquids, 11: 4344(J)

radioinduced, use of irradiated polymers as initiators, 11: 1802(J)

of vinyl acetate by high energy radiation, 11: 1768(J)

x- and γ-ray induced in aqueous solutions of acrylamide, 11: 6278(J)

Polymers

(See also specific polymers, e.g., Boron polymers; Styrene polymers.)

cross linking, effect of ionizing radiations, 11: 1376(J)

dynamic properties, effects of radiation on, 11: 11107(R)

electrical properties of irradiated, 11: 10465

physical properties and structure of fluorinated, 11: 1455(J)

post-irradiation oxidation, 11: 965(J)

preparation of coördination, 11: 2876(R)

preparation of diketone- and diazo-type, 11: 207(R)

properties, evaluation handbook for, 11: 81

radiation chemistry, 11: 960(J)

Polymers (cont'd)

radiation effects, 11: 3358(J), 8857

radiation effects, mechanism of high-energy, 11: 6678(J)

radiation effects measured by vibration techniques, 11: 5813(J)

radiation effects on long-chain, 11: 210(J)

radiation effects on organic, 11: 3558, 6290

radiation-induced graft copolymerization, 11: 1372(R)

resistance to solvent action, effect of irradiation, 11: 3637(P)

synthesis and stability, 11: 9985

synthesis for high-temperature applications, 11: 209(R)

Polyphenyls

(See also Biphenyl; Biphenyl, isopropyl-; Terphenyl.)

boiling point and melting point, 11: 11916

burnout studies, 11: 12891(R)

burnout studies, test equipment, 11: 6704(R)

compressed-pellet, infrared analysis for isomers, 11: 5794(J)

corrosive effects and moderating properties, 11: 12239(R)

corrosive effects of Santowax R mixture on reactor materials, 11: 13321

development and properties for engine lubricant, 11: 11156(R)

heat transfer, 11: 5836(R), 12012(R), 13308(R)

in-pile testing as reactor moderators, 11: 6568(J)

phase studies of binary and ternary mixtures, 11: 12324

physical and chemical properties and radiation stability, 11: 7429(R)

radiation effects, 11: 7847(R)

radiation effects on ultraviolet spectra, 11: 10464

synthesis, lubricity, and other properties, 11: 11133(R)

ultraviolet spectra of diphenyl, mono-isopropyl diphenyl, and irradiated mono-isopropyl diphenyl, 11: 10464

Polyphosphates

hydrolysis, kinetics and mechanism, 11: 2821(J)

Polysaccharides

blood vascular levels of irradiated dogs, 11: 5730(J)

radiation chemistry, 11: 960(J)

staining, for electrophoretic or chromatographic determination, 11: 3331(J)

Polystyrene
See Styrene polymers.

Polythene
See Ethylene polymers.

Pool Test Reactor (PTR)
See Swimming pool reactors.

Popsy
See Critical assemblies.

Populations

(See also Genetics; Statistics.)

genetic studies, 11: 11862(J)

hazards from environmental Sr^{90}, 11: 13249(J)

natural microbial, lethal effects of γ radiation, 11: 847(J)

radiation effects on, of Collembola, 11: 13245(J)

radiosensitivity, 11: 9941(J)

statistical analysis of human, for vital, health, and genetic data, 11: 12635

steady-state, of Saccharomyces, effects of chronic radiation exposure, 11: 11843

Porcelain
insulation properties at elevated temperatures, 11: 1860(J)
Porcelain enamels
decontamination, radiochemical methods for, 11: 9587(R)
Porous materials
(See also Graphite; Porous metals; Uranium oxide compacts.)
boundary layer control, properties, fabrication, and corrosion resistance, 11: 7169
heat transfer from fluid stream to tubes, 11: 6328
pore volume, methods for computing, 11: 11990(J)
properties of, deduced from apparent volume measurements, 11: 11251
surface mobility effect on gas phase transport through, 11: 11249
thin film effect on Knudsen flow of gas through, 11: 11250
Porous metals
applications in fabrication of safety devices for explosive gases, 11: 462(J)
flow of distilled water in, retardation of, 11: 1038
Porphines
copper tetraphenyl-, hyperfine structure of paramagnetic resonance spectrum, 11: 2075(J)
Porphyrin complexes
radiation effects, 11: 8259(R)
Porphyrins
radiation chemistry, 11: 13566(R)
radiation effects, 10803(R)
radiosensitivity effects in biological systems, 11: 11898(J)
urinary excretion following x irradiation, 11: 1394
Positronium
annihilation, review of information on, 11: 7300(J)
annihilation in gases and evidence for n = 2 states, 11: 6864
annihilation probabilities of para-, first radiative corrections to, 11: 5527(J)
formation and quenching, 11: 1273(R), 1542(R)
formation in gases, 11: 3515(J)
formation in liquids and amorphous solids, 11: 6495(J)
formation in solids, 11: 575(J)
hyperfine structure in ground state, 11: 9452(J)
Zeeman effect of ortho-, 11: 7292(R)
Positronium compounds
ortho-para converters, 11: 1278(R)
Positrons
(See also Electron pairs.)
angular distributions of, from $\pi^+ - \mu^+ - e^+$ decays in liquid H bubble chamber, 11: 6022(J)
annihilating in Al, lifetime, 11: 437(J)
annihilation, angular distribution of γ quanta in, 11: 3514(J)
annihilation, component intensities, 11: 2027(R)
annihilation, polarization effects in two-quantum, 11: 6777(J)
annihilation in gases, angular correlations of 2 quantum, 11: 6864
annihilation in liquid He, 11: 2027(R), 6023(J), 6024(J), 6494(R)
annihilation in metals, 11: 4915(J), 5936(J)
annihilation in solids, magnetic quenching of 3-photon, 11: 1948(J)
asymmetry, information from muonium experiments, 11: 10216(J)
asymmetry parameter, radiative corrections in muon decay, low-energy, 11: 11345(J)
Positrons (cont'd)
backscattering, 11: 4151(J)
behavior in condensed materials, 11: 7300(J)
branching ratios, K capture to, 11: 10610(J)
elastic scattering by point nuclei, calculations of Mott cross sections, 11: 744(J)
elastic scattering of electrons, radiative corrections, 11: 12786(J)
emission by polarized Co^{58} nuclei, asymmetry, 11: 6034(J)
emission in F^{18}, ratio of K capture to, 11: 2074(J)
emitted by C^{12} nuclei during monopolar o-o transition, 11: 10253(J)
energy loss and range in materials, 11: 4914
ionization at origin of high-energy electron-position pairs, 11: 10337(J)
multiple scattering by Al, Ag, and Au at 0.4 Mev, 11: 5398(J)
pair production cross sections, 11: 3509
polarization demonstrated by annihilation in magnetized Fe, 11: 10265(J)
properties of, book, 11: 12193(J)
scattering by point nuclei, calculations of Mott cross sections, 11: 744(J)
scattering of high-energy, by electrons, 11: 1952(J)
scattering of high energy, in lead, 11: 11266(J)
scattering of 9.8-Mev, by Xe, 11: 8212(J)
transformation properties of electron-positron field amplitudes, 11: 12787(J)
Potassium
amperometric determination with tetraphenylborate, 11: 1444
chemical properties, 11: 8283(R)
determination in muscle tissue by neutron activation analysis, 11: 4315(J)
electric resistivity of thin films, 11: 4632(R)
excretion in rats, tracer study, 11: 4809(J)
flame photometric determination in mixtures, 11: 5796(J)
heart content in rabbits, effects of irradiation, 11: 3667(J)
heat of reaction of colloidal with KCl crystals, 11: 7888(R)
isotopic composition, 11: 471(J)
metabolism, tracer studies using K^{42}, 11: 11021(R)
metabolism in swine, tracer study, 11: 5134(R)
separation from Li by extraction with dipivaloylmethane, 11: 121(J)
spectrophotometric determination in Be, 11: 10813(R)
thermal capacity and related properties at low temperatures, 11: 7205(J)
Potassium (liquid)
interatomic potential function, 11: 540(J)
surface tension, 11: 8264
Potassium acid fluorides
fused, for U refining, 11: 3226(P)
Potassium alloys
crystal structure, 11: 1878
Potassium borates
corrosion of Al in solutions of, 11: 13054
Potassium borohydrides
heat of solution in liquid NH_3, 11: 3681
Potassium bromide crystals
optical properties, effect of low-temperature plastic deformation, 11: 11280(J)

Potassium bromide–potassium chloride systems

density, comparison of x-ray and pycnometric, 11: 2823(J), 5370(R)

Potassium bromides

lattice parameter measurements of single crystals, 11: 5798

pycnometric and x-ray densities, 11: 2823(J)

radiation and temperature effects, 11: 9587(R)

Potassium chlorates

crystal structure from Zeeman studies, 11: 9587(R)

spectra, Zeeman effect on quadrupole, 11: 7373(J)

Potassium chloride–barium chloride–uranium(III) chloride systems (liquid)
See Barium chloride–potassium chloride–uranium(III) chloride systems (liquid).

Potassium chloride crystals

electronic charge density, 11: 11254(R)

electronic structure, 11: 4490(R)

heat of reaction of, with colloidal K particles, 11: 7888(R)

mechanism for conversion of U-centers to F-centers in KCl–KH crystals, 11: 1553(J)

paramagnetic resonance study of U-center containing, irradiated, 11: 1552(J)

quantum yield from photochemical conversion on F centers in, at +280°, 11: 391(J)

thermal conductivity vs temperature, 11: 1922(R)

Potassium chloride–lithium chloride systems
See Lithium chloride–potassium chloride systems.

Potassium chloride–lithium chloride systems (liquid)
See Lithium chloride–potassium chloride systems (liquid).

Potassium chloride–lithium chloride–uranium(III) chloride systems (liquid)
See Lithium chloride–potassium chloride–uranium(III) chloride systems (liquid).

Potassium chloride–lithium chloride–uranium(IV) fluoride systems (liquid)
See Lithium chloride–potassium chloride–uranium(IV) fluoride systems (liquid).

Potassium chloride–potassium bromide systems
See Potassium bromide–potassium chloride systems.

Potassium chloride–potassium iodide systems

electrical conductivity, 11: 3688(J)

Potassium chloride–potassium systems
See Potassium–potassium chloride systems.

Potassium chloride–sodium chloride systems

electrical conductivity, 11: 3688(J)

equilibrium between Ti metal and $TiCl_2$ and $TiCl_3$ in, 11: 3324, 10097(J)

phase studies of Ti, $TiCl_2$, $TiCl_3$ in, 11: 3324

Potassium chloride–sodium chloride–zirconium chloride systems

phase diagrams, 11: 2929(J), 7932

Potassium chloride–zinc chloride systems

phase diagrams, electric conductivity, and density, 11: 5914(J)

Potassium chloride–zirconium chloride systems

phase diagrams, 11: 2929(J)

Potassium chlorides

annealing theory, 11: 9611(R)

chromatographic separation from alkali metal halides using C_6H_5OH–CH_3OH–HCl, 11: 4830(J)

composition diagram of melting, 11: 1770(J)

gamma emission from Co^{60}, effects on aqueous solutions of, 11: 1803(J)

Potassium chlorides (cont'd)

pycnometric and x-ray densities, 11: 2823(J)

structure, 11: 538

Potassium cyanides

effect of plastic deformation on, at 3000 to 50,000 atm, 11: 13262(J)

Potassium cyanocobaltates (III)

Szilard–Chalmers reactions in, 11: 8834(J)

Potassium fluoborates

fractional decomposition of, isotope effect, 11: 4835(J)

preparation from boron trifluoride–methyl ether complex, apparatus for, 11: 12340

preparation from dimethyl ether–BF_3, 11: 9590(R)

production from BF_3–$(CH_3)_2O$ complex, 11: 11503(P)

Potassium fluonickelates

preparation, 11: 11586(R)

Potassium fluoniobates

sodium reduction for preparation of Nb oxide, 11: 12047

Potassium fluoride–beryllium fluoride–sodium fluoride systems
See Beryllium fluoride–potassium fluoride–sodium fluoride systems.

Potassium fluoride–beryllium fluoride systems
See Beryllium fluoride–potassium fluoride systems.

Potassium fluoride–bromine fluoride systems
See Bromine fluoride–potassium fluoride systems.

Potassium fluoride–potassium systems
See Potassium–potassium fluoride systems.

Potassium fluorides

thermal conductivity and theoretical equations for estimating, 11: 2552

Potassium halides

energy level calculations for F-centers and interstitial positive ions in, 11: 12777

Potassium hydrides

mechanism for conversion of U-centers to F-centers in KCl–KH crystals, 11: 1553(J)

Potassium hydrogen thorium nitrates

crystal structure of $H_4K_2Th(NO_3)_{11}$, 11: 2843(J)

Potassium hydroxides

corrosive effects, 11: 11688(R)

recovery, feasibility of lime and NaOH precipitation systems, 11: 12337

Potassium hydroxides (liquid)

manganate distribution, effects of O_2 and pressure on, 11: 3332(J)

Potassium iodates

neutron irradiation, chemical state of radioiodine, 11: 4336(J)

radiation chemistry, 11: 12960(R)

Potassium iodide crystals

carbon ion bombardment, light output under, 11: 7355(J)

luminescence, radiation effects on, 11: 13578(R)

optical properties, effect of low-temperature plastic deformation, 11: 11280(J)

ultraviolet spectra, 11: 7405(R)

Potassium iodide–potassium chloride systems
See Potassium chloride–potassium iodide systems.

Potassium iodide–thallium iodide systems

phosphorescence, long-lived decay, 11: 8266(R)

Potassium iodides

activation analysis, spectra, 11: 7455(R)

exchange reactions of I_2 between p-fluorohenzyl iodide and, 11: 76

Potassium iodides (cont'd)
lattice parameter measurements of single crystals, 11: 5798
radiation effects, 11: 13565(R)
Potassium isotopes
separation methods, 11: 8557(R)
thermal neutron reactions (n,γ), 11: 710(J)
Potassium isotopes K^{39}
deuteron reactions (d,p), 11: 12186(R)
energy levels, 11: 1542(R), 6064(J)
hyperfine structure of 4P state, 11: 1309(J)
neutron resonances in kev region, 11: 6065(J)
neutron total cross sections, 11: 9189(R)
nuclear electric quadrupole moment, 11: 5554(J)
proton reactions (p,γ), 11: 4717, 6064(J)
proton reactions (p,γ), angular distributions and correlations of gamma radiation, 11: 9143(J)
Potassium isotopes K^{40}
beta emission and K capture ratios, 11: 9752(R)
biological effects of radiation from, on animals, 11: 8771(J)
biological role, 11: 4223(J)
decay to Ar^{40}, 11: 13351(J)
energy levels, 11: 8562(R)
gamma counting techniques for measuring body content, 11: 5499(J)
half life, 11: 12963(R)
physiological effects on isolated frog heart, 11: 12648(J)
separation from fission products in urine and vegetation, 11: 8791(R)
three-body nuclear interaction in, 11: 11306(J)
Potassium isotopes K^{41}
neutron total cross sections, 11: 9189(R)
Potassium isotopes K^{42}
applications in external localization of brain tumors, 11: 68(J)
formation in neutron-irradiated foodstuffs, 11: 5733
Potassium isotopes K^{43}
decay, 11: 10232(R)
gamma spectra, 11: 6965(J)
Potassium isotopes K^{44}
half life, 11: 13114(R)
Potassium niobates
dielectric properties and phase transitions, 11: 968
Potassium nitrates
crystal structure, x-ray measurements of thermal expansion, 11: 1206(J)
crystallization, entrainment of impurities during, 11: 6239(J)
equilibrium between $NaNO_3$, Na_2SO_4, K_2SO_4, and, 11: 6751(J)
molten, effects on Ni, Co, Al, and some types of steel, 11: 1918(J)
Potassium oxalates
radiation effects, 11: 12970(R)
Potassium perruthenates
crystal structure, 11: 7430(R)
Potassium pertechnetates
solubility in H_2O, 11: 11574(R)
Potassium–potassium chloride systems
phase equilibria and electric conductivity, 11: 11576(R)
Potassium–potassium fluoride systems
phase studies and vapor pressure, 11: 9587(R)
Potassium silicate glass
diffusibility to Ar, 11: 1956
Potassium–sodium alloys
analysis for H_2, 11: 2264
deuteron and neutron induced activities in MTA target coolant, 11: 11819
bonding properties and high-temperature tests, 11: 13969(R)
disposal of, 11: 13580(R)
entropy at 0°K, thermal capacity, 11: 2920(R)
fission product contamination in EBR, 11: 11746(R)
high-temperature reactions with H_2O, 11: 4446(R)
particle size measurement of UO_2 powders in, 11: 8845(J)
reactions with Ga, 11: 8461
reactions with hydrogen in organic solvents, 11: 4380
thermal capacity and related properties at low temperatures, 11: 7205(J)
thermal properties, 11: 7718(R)
Potassium–sodium alloys (liquid)
analysis for oxygen, 11: 8290
bearing tests in, evaluation of materials, 11: 2422, 10921(R)
bearing wear in, 11: 10921(R)
bubblers, 11: 13968(R)
charging Experimental Breeder Reactor fuel rods with, 11: 11742(R)
convection heat transfer data, 11: 13869(R)
cooling properties for fast reactors, 11: 8682
corrosive effects on Ni and stainless steel, 11: 2481(R)
corrosive effects on Zr, Ti, and Globeiron, 11: 7727
dimensional stability of Th in, 11: 12495
heat transfer characteristics, 11: 11748(R)
heat transfer coefficients, 11: 13868(R)
heat transfer properties of, in turbulent flow, 11: 6708(J)
high-temperature reactions with water, kinetics, 11: 8919
lubricity for bearing materials, 11: 2447
mass transfer of stainless steel and Zr in loops, 11: 6719
performance of tungsten carbide journal bearings in, 11: 2448
properties as a reactor coolant, 11: 5832(J)
reaction with water, 11: 6209(R), 7727
reactions with various materials in air, 11: 2251
suspension of UO_2 in, as reactor slurry, studies in loops to 600°C, 11: 10314(J)
wetting temperature of fuel element components by, 11: 4464(R)
Potassium sodium tartrates
detection of lattice vibrations from particle bombardments using, 11: 2757
radiation effects, 11: 12970(R)
Potassium sulfates
equilibrium between $NaNO_3$, KNO_3, Na_2SO_4, and, 11: 6751(J)
Potassium thorium chlorides
electrolysis for Th production, 11: 7687
Potassium thorium fluorides
electrolysis for Th metal production, 11: 7687, 8533, 13096(R)
phase diagrams of, and sodium thorium fluorides, 11: 8852(J)

Potassium titanates
breakdown voltage, 11: 261(J)

Potassium tungstates
composition diagram of melting, 11: 1770(J)

Potassium uranium fluorides
electrolysis to U, 11: 2368(R)

Potatoes
irradiation effects of Co^{60} on content of vitamin C in, 11: 11853(J)

Potential
See Ionization potentials.

Potentiometers
direct digital indicating dial, design, 11: 2568
helical, 1000 ohm, 9.6-turn, development of, 11: 2569
radiation effects, 11: 8215

Potentiometric analysis
polarization time lag measurement method, 11: 1773

Potts Factor Mine (Utah)
uranium occurrence, 11: 10539

Powder metallurgy
applications of ultrasonic energy, 11: 5889(R)
beryllium fabrication by, 11: 11692(R)
design and operation of a automatic press for ceramic powders, 11: 4846
fabrication of reactor materials by, 11: 7995(J)
packing of particles, basic concepts and application to silicon carbide powders, 11: 8464
particle size determination in, methods for, 11: 367(J)
performance of pneumatic forming machine for compacting aluminum oxide powders, 11: 13331
for preparation of thermosetting alloys of reactive metals, 11: 6590(P)

Powders
(See also Brass powders; Graphite powders; Metal powders; Oxide powders; Particles.)
dispersion of fine, from small reservoirs, 11: 3440
particle size distribution determination in, photoelectric counter for, 11: 7247(J)
size and distribution of sub-sieve, determination of, 11: 5363
size determination in powder metallurgy, 11: 367(J)

Power
See Electric power; Nuclear power; Power reactors; Solar power.

Power Breeder Reactor
See Argonne Power Breeder Reactor.

Power Breeder Reactor Prototype
See Argonne Power Breeder Reactor.

Power breeder reactors
(See also Argonne Power Breeder Reactor; Calder Hall Reactors; Dounreay Fast Reactor; Experimental Breeder Reactor; Hanford Dual Purpose Reactor; KAPL Intermediate Power Breeder; KAPL Plutonium Power Breeder Reactor; Thorium Breeder Reactor.)
accidents to APDA, study of low probability, high hazard, 11: 6089
blanket processing and Pu^{240} production, 11: 8678
breeding blankets for, status of development, 11: 8598
cooling water system proposals, 11: 13919
cost analysis, 11: 13190
cost factors, effects of geometrical and operational variables, 11: 12586
cost relations to natural U reactors, 11: 4681
criticality studies, stability, fuel, recovery, core materials, fuel loading and unloading equipment, and coolant flow in core during scram conditions, 11: 7727

Power breeder reactors (cont'd)
design, fuel element fabrication and processing, control methods, safety, and economic aspects of Dow-Detroit Reactor, 11: 11807(R)
design and criticality studies, 11: 13965
design and economic evaluation of types of, 11: 12596, 13917, 13964
design and feasibility study of U^{233}, 11: 7756
design and safety, 11: 10276
design and safety features of Enrico Fermi, 11: 2104
design and site considerations of APDA, 11: 6887
design data for NAA power-converter reactor, 11: 13971
design of core using hexagonal fuel channels, 11: 7024(P)
design of fluidized-solid fuel, 11: 12533
design of French and British, 11: 681(J)
design of French G2 and G3, 11: 4696(J)
design of fused salt fuel, fast, 11: 10724
design of gas-cooled ceramic-fueled, 11: 4080
design of homogeneous boiling slurry type, 11: 13906
design of Na-graphite, 11: 8687(R)
design of sodium-graphite fluid-fuel, proposed program, 11: 8665
design studies on fast, 11: 13167
development, in the U.S.S.R., 11: 2121
development of Dow-Detroit, 11: 13989
economic aspects, 11: 8685(R), 13962
economics of Th^{232} and U^{238}, 11: 652
engineering design of, calculations on, 11: 7727
feasibility report on fluidized-solids, 11: 9858
fuel balance and reactivity of recycled Pu, 11: 12899
fuel element cladding materials, 11: 8698
fuel element dimensional tolerances, 11: 13861
fuel element fabrication using wire cloth bearing fuel, 11: 13169
fuel processing costs for Th, 11: 9866
fuel reprocessing, 11: 10750(J)
fused-salt, design, 11: 13903
heat transfer studies of externally fuelled, internally cooled with liquid, 11: 13168
pressure vessel for, design and fabrication of, 11: 13128
safety features of APDA reactor, 11: 4110(J)
self-purifying high-temperature, 11: 6713
transient behavior of APDA, simulator study, 11: 2103

Power cycles
design for HRE, 11: 7750
and prime movers for nuclear power plants, 11: 10948

Power plants
(See also Nuclear aircraft power plants; Nuclear power plants; Steam power plants; Submarine power plants.)
comparison of nuclear and oil-fired, for surface vessels, 11: 13980(R)
performance calculations for electric, consisting of a nonautomatic extraction turbogenerator, 11: 4406

Power reactors
(See also specific reactors used for production of power.)
conference notes on industrial applications, with natural and enriched fuels, 11: 13225(J)
construction progress at Berkeley, 11: 6188(J)
construction underground, feasibility of, 11: 4665

Power reactors (cont'd)

control and endurance evaluation by means of critical experiment, 11: 13929

control of graphite-moderated, gas-cooled, by liquid Cd neutron absorber, 11: 7729

control problems, 11: 1340(J), 5006, 5599(J)

coolants for, compilation of technology on organic moderator, 11: 3558

cost factors and design specifications of pebble-bed-type, 11: 12576

cost factors for EBWR, 11: 10744(J)

criticality studies, 11: 682(J), 2675, 2728

criticality studies on USSR, 11: 677(J), 4700(J)

description of Russian, for 420 Mw power station, 11: 11437(J)

design, 11: 637, 681(J), 1340(J), 3268(J), 3559(J), 4219(J), 4694(R), 5602(J), 8635, 13965

design, comparison of types, 11: 637

design, control, and power distribution for moving fuel, 11: 13163

design, economics, and nuclear characteristics, 11: 12599

design, general introduction, 11: 6916(J)

design, heat transfer, and cost factors, 11: 11758

design and construction of Hunterston, Ayrshire Reactor, 11: 5601(J)

design and cost factors of, for economic power production, 11: 13917

design and feasibility study of 600-Mw, fused-salt fuelled, 11: 7325

design and heat transfer, 11: 13179

design and industrial applications, 11: 12583

design evaluation program, 11: 9873(R)

design for producing superheated steam, 11: 9556(P)

design for use in nuclear powered merchant vessels, 11: 3646(R)

design for use in USSR atomic electric power station, 11: 676(J)

design of, for direct generation of electric power from fission energy, 11: 13833

design of advanced, solid fuel, moderators, coolants, and fuel cycles, 11: 2128(J)

design of Be-moderated He-cooled, 11: 13958

design of closed-cycle boiling reactor for the Rural Cooperative Power Association Reactor, 11: 2775(J)

design of Enrico Fermi fast breeder, 11: 5608(J), 6103(J)

design of experimental, 11: 3078

design of fast breeders, 11: 4112(J), 6102(J)

design of fission-plasma for direct electric power, 11: 10749(J)

design of fluid fuel, with heat removal by direct contact cooling, 11: 2106

design of French, 11: 667(J)

design of D_2O moderated, Pb–Bi cooled, natural U, 11: 8697

design of heterogeneous boiling, 11: 10923(R)

design of homogeneous, fuel costs in batch and continually processed, 11: 5014

design of homogeneous, thermal, 11: 13891

design of liquid-metal-fueled, with closed-cycle gas turbine, 11: 6538(J)

design of molten fuel, 11: 13957

design of pressurized water, 11: 5032(R), 5033(R), 6095(R)

design of pressurized-water, for remote installation, 11: 11744(R)

design of proposed 80,000 kw homogeneous, 11: 7865

design of rotating, for better heat removal, 11: 11523(P)

design of Na-graphite, 11: 8687(R)

Power reactors (cont'd)

design of water-cooled, graphite-moderated, eariched U, 11: 1664(J)

design of water moderated, with fuel cycle using natural U feed and Pu recycle, 11: 5023

design studies on high-temperature gas cooled, 11: 8696(R)

development in the USSR, 11: 10388(J), 11832(J)

economic aspects, 11: 5589, 5590, 10410

economic aspects of industrial applications, 11: 7(J), 6068

economic aspects of natural U–D_2O, in Canada, 11: 5578

economic aspects of power-breeder and natural U reactors, 11: 4681

economic evaluation of organic moderated homogeneous, 11: 12549

economics of molten fuel, 11: 13957

fission product handling and disposal, 11: 9283

fission product separation by nuclear recoil in, feasibility, 11: 1341(J)

frequency response measurements of characteristics, 11: 6912(J)

fuel alloys for use in, 11: 1124

fuel cost of UO_2SO_4–Li_2SO_4–D_2O-fuelled, 11: 13139

fuel element development studies, 11: 13806(R)

fuel element materials, 11: 8471

fuel recovery by volatility separation processes, 11: 10820(R)

fuel recovery from heterogeneous, cost factors of Purex Process for, 11: 13020

fuel reprocessing studies, 11: 659(J), 681(J), 1006(J), 3550, 6304(J), 6890, 7509(R), 7513(R), 8874(J), 11618, 12965(R), 13682(R)

fuel requirements in 150-Mw, 11: 4097

fuel requirements (U^{235}), 11: 2708

fuel rods for, heat generation after removal from reactor, 11: 12577

fuel solutions, cost factors, 11: 11770

fuelling system for natural uranium reactor with long rods for high burn-up without recycling, 11: 6894

health physics instrumentation for, 11: 9954(J)

heat output capabilities of pellet fuel, 11: 14015

heat removal, 11: 6918(J)

homogeneous, heavy water, design study, 11: 8183(J)

homogeneous aqueous, development and prospects, 11: 9112(J)

industrial application, factors governing, 11: 7817

instrumentation of gas and steam circuits, 11: 7249(J)

internal recombination of H_2O, 11: 14014

large aqueous homogeneous, cost factors of U- and Pu-fueled, 11: 8708(R)

molten-fluoride homogeneous Th–U^{233} converter, design, 11: 13939

neutron leakage from 30 megawatt sodium graphite, 11: 8175

plutonium producing, design development, 11: 9849

poisoning, 11: 13965

power removal with steam turbine, optimum conditions, 11: 5587, 5605(J)

production costs of, effects of fuel irradiation time on, 11: 11780

reactivity, slow changes for, 11: 2728

reactivity control by introduction of Er poison, 11: 7843(R)

reloading cycle for, 11: 10734

safety, 11: 56(J), 5025(R)

safety evaluation of Na cooled graphite-moderated, 11: 7849

specifications, 11: 7850(R)

Power reactors (cont'd)

steam cycles, 11: 6917(J)

survey of, for industrial power production, 11: 13959

theory, 11: 13113(R)

waste disposal problems, 11: 1843(J), 3376(J), 5066

water dissociation in, effect of temperature, pressure and irradiation on, 11: 2631

Power supplies

(See also Accelerator tubes; Current regulators; Electric power; Voltage regulators; Rectifiers.)

circuit diagrams for a-c and d-c, 11: 3935(R)

design and operation of reluctance motor drive coupled to control rods, 11: 13991

design of corona stabilizer tube, for use with proportional and Geiger counters, 11: 6468

design of 10-kv d-c, 11: 550(R)

design which produces d-c voltage independent of frequency and wave shape, 11: 7035(P)

electric properties of ignitrons, 11: 11748(R)

high-voltage, utilizing mechanical choppers, 11: 7240

high voltage for spectrochemical analysis, 11: 11825

operation and maintenance of Bevatron, 11: 1357(R), 13530

ripple voltages in synchrotron magnet, 11: 3185(J)

transistorized d-c power converter with regulated output, 11: 10617

unconventional electric, 11: 8974

PPA

See KAPL Intermediate Power Breeder Critical Experiments; Submarine Intermediate Reactor Experiments.

Praseodymium

electric conductivity and phase studies as a function of temperature, 11: 10359(J)

heat of vaporization and melting point, 11: 1471

ion exchange using ENTA, 11: 6302(J)

magnetic susceptibility from 1.5 to 300°K, 11: 9171(J)

neutron total cross sections and resonances in kev region, 11: 4047(J)

physical and chemical properties, 11: 5816(J)

spectrographic determination in Mg, 11: 3705(J)

Praseodymium complexes

with nitrosonaphthol, formation constants, 11: 4301(J)

with thiourea, 11: 10031(J)

Praseodymium isotopes Pr^{141}

lifetimes, determination by method of delayed coincidences, 11: 8227(J)

Praseodymium isotopes Pr^{142}

decay schemes, 11: 9752(R)

Praseodymium isotopes Pr^{143}

internal bremsstrahlung, 11: 4055(J)

Praseodymium isotopes Pr^{144}

beta decay spectra, 11: 8239(J)

decay schemes, 11: 3210(J)

gamma emission, 11: 9054(R)

half life, 11: 9752(R)

Praseodymium nitrates

thermolysis, 11: 972(J)

Praseodymium oxides

phase studies of the region $PrO_{1.83}$ to $PrO_{2.00}$, 11: 9250(J)

Precipitates

(See also Uranium leach precipitates.)

on filter paper, total absolute activity estimation, 11: 4294(J)

filtration, apparatus for, 11: 5087(P)

Precipitation

(See also Electrostatic precipitation.)

application to analytical and physical chemistry, 11: 1007(J)

thermodynamics, 11: 12330(R)

Precipitators

See Cascade impactors; Cyclone separators; Electrostatic precipitators; Particle precipitators.

Preferred orientation

method for detecting small degrees of, 11: 12498

Pregnancy

radioinduced pathological effects on, and labor in rats, 11: 10403(J)

Pressure

(See also Blood pressure; High-pressure systems; Pressure gages; Pressure vessels; Pumps; Seals and glands; Valves; Vapor pressure.)

effects of 30,000 atm., on crystal structure of matter, 11: 1204(J)

measurement of very low, design of primary standard for, 11: 2565

physics of superhigh, review, 11: 10589(J)

super-high, of solids and liquids, chemical techniques for investigating, 11: 7106(J)

Pressure drop

(See also Fluid flow; Gas flow; Liquid flow.)

boiling and non-boiling, in vertical rectangular channels at 2000 psia, 11: 10061

correlation, Martinelli-Nelson, two-phase flow phenomena, 11: 1185

steam–water, in an annulus with heat transfer, 11: 8893

Pressure gages

(See also Hypsometers; Manometers; Vacuum gages.)

design, for use with electromagnetic liquid metal pumps, 11: 2437

design of diaphragm-type, for shock wave measurement, 11: 2578

design of overpressure indicator, 11: 7032(P)

design of restrained diaphragm, 11: 13841

for measurement of low vapor pressures, 11: 12072(J)

response time calculation, 11: 5940

theory of free-molecule orifice-type for isentropic and nonisentropic flow, 11: 11165

Pressure regulators

pressure-balancing control valve for HRT, flow characteristics, 11: 9813

Pressure systems

bellows mounted with O-ring seals, 11: 1511

calculation of maximum size ductile rupture in, 11: 13306

null-balance transmitter, Moore Products Company, 11: 7696

rupture, corrosion, and chromate formation in, 11: 6700(R)

Pressure transmitters

application in pulse columns, 11: 12700

design and performance, 11: 7696

Pressure vessels

(See also Tanks; Vessels.)

allowable pressure differentials for HRT core, 11: 12880

applied loading; evaluation of codes for, 11: 8890

brittle failure of HRT, possibility, 11: 8605

Pressure vessels (cont'd)
closure for, photoelastic analysis of, 11: 12869
construction materials, properties, 11: 3437(J), 4852(J), 4853(J), 5904(J)
design, effect of size, 11: 1912(J)
design, fabrication, testing, and inspection, 11: 1845(J)
design, significance of tensile test to, 11: 3437(J)
design and construction for ETR, 11: 5611(J), 5612(J)
design and construction for PWR, 11: 3079, 5038(J)
design and fabrication, safety considerations, 11: 12588
design and fabrication for a light-water-moderated reactor, 11: 13128
design and operation for corrosion testing in pressurized hot water, 11: 4860
design and stress analysis for HRT, 11: 680(J), 2105, 2657, 5012, 6074, 6092
design calculations for in-pile pressure tubes, 11: 14004
design for enclosing high-voltage generator, 11: 9548(P)
effects of gaseous detonation on, 11: 1541
fabrication for Calder Hall Reactors, 11: 9118(J)
fabrication of EBWR, 11: 11748(R)
fabrication of large Sn–Zr alloy, 11: 13516(J)
fast neutron flux calculated in, 11: 13112
fatigue resistance of nozzles in, 11: 8935(J)
flow studies in PWR, 11: 12608(R)
force distribution calculations, 11: 3785(J)
for fuel element testing for the SAR, 11: 10965
gamma heating of APPR-1, 11: 6886, 8163
heat generation in, by γ rays, 11: 4012
leakage detection, 11: 2541
materials, fabrication and testing for naval reactors, 11: 12605
operating experience with NRX, 11: 5017
performance of PWR, 11: 13782(R)
plenum flow distribution and time constants, 11: 13310
plenum mixing and flow constants in, methods for determining, 11: 13500
radioinduced heating in BER, 11: 11745(R)
rupture, leakage flows, 11: 13499
safety codes, principles for revision of, 11: 1928(J)
spherical, hydrodynamics, 11: 2641
strength testing of Carilloy T-1 reactor, 11: 10923(R)
stress analysis, 11: 633, 2119, 2703, 3074
stress analysis for S3G reactor, 11: 13051
stress analysis of, for homogeneous research reactor, 11: 10943
stress analysis of STR, 11: 1050, 1311
stress analysis techniques for thick reactor, 11: 12242
stresses and welding of HRT, 11: 7859(R)
stresses in reactor, 11: 679(J), 2450
temperatures and design of EBWR, 11: 11747(R)
temperature and pressure cycling of a full diameter test, 11: 3780
testing of PWR, 11: 2124
thermal stress, in APPR, 11: 2098, 6886
welding problems in, for nuclear reactors, 11: 12066(J)
welding procedure for closure of, 11: 2499

Pressurized water reactors
(See also Army Package Power Reactor; Carrier Vessel Reactor; LEO; Naval reactors; Shippingport Pressurized Water Reactor; Submarine Advanced Reactor; Submarine Fleet Reactor; Submarine Reactors (S1C); Submarine Reactors (S5W); Submarine Thermal Reactor; Yankee Power Reactor.)
analysis of moving-fuel, two-space-dimension multigroup, 11: 11415
automatic neutron flux plotting, 11: 9103
breeding element testing, 11: 8714
code for IBM-704 for thermal transients, 11: 9391
control and poisoning, 11: 8717(R)
control by power and temperature measurement, 11: 5596
control of, by coolant pressure regulation, 11: 12903
coolant radioactivity from leaks, and radioactivity vs. crud particle size, 11: 10291(R)
coolant technology, 11: 247(J), 1330, 1501, 5264
cooling system for, development of pressure regulated, 11: 12903
core designs, thermal and hydraulic properties, 11: 10987(R)
core structure design, 11: 11806(R)
corrosion in, research program on, 11: 13501
corrosion inhibitors for neutron shield tank, 11: 166
corrosion problem in, 11: 12907(J)
criticality and reactivity studies, 11: 8718(R)
criticality studies, 11: 682(J), 8717(R), 11806(R)
criticality studies, reactivity, and shield design, 11: 8719(R)
design, 11: 681(J), 2125, 2727, 4694(R), 8717(R), 8719(R), 13114(R)
design, control, and fuel element fabrication, 11: 8715(R)
design, core meltdown, fuel element design, control systems, coolant processing, shielding, and reactivity, 11: 13189(R)
design and cost factors of 200,000 kilowatt power plant using, 11: 6537
design and evaluation as power-breeder, 11: 12596
design and specifications, 11: 8718(R)
design for atomic power plant with 11,500 kev output, 11: 2775(J)
design for 80,000 kw light water nuclear power plant, 11: 1331
design for merchant vessels, 11: 12901
design for power production, 11: 5032(R), 5033(R), 6095(R)
design of, including power plant, cooling system, and control system, 11: 8720(R)
design of packaged, for construction in UK, 11: 5039(J)
design parameters and economic studies, 11: 10981
development studies, 11: 13782(R)
fabrication of in-pile UO_2 test fuel bundles, 11: 9877
fission product removal from cooling system, proposed program, 11: 13992
fuel, economics of U^{235} and Th, 11: 2775(J)
fuel element cladding materials, 11: 8698
fuel element design and materials, 11: 8716(R)
fuel element end closure development, 11: 10985
fuel element fabrication, 11: 1141, 5030, 8719(R), 11806(R)
fuel element fabrication cost factors, 11: 9115(J)
fuel element inspection, 11: 9876
fuel element irradiation and rupture in, 11: 8713
fuel-element radiation damage, 11: 8712
fuel element testing, 11: 7728
fuel element testing, preliminary tests and fabrication for, 11: 13999

Pressurized water reactors (cont'd)
fuel rod assembly methods evaluation, 11: 12607
fuel rod end closures, radiographic inspection techniques, 11: 1063
fuel rod end sealing by welding, 11: 12523
fuel rods, weld inspection of, 11: 11749
fuel rods end capping, 11: 13780
heat transfer in PuP, 11: 9851
leakage flows, 11: 13499
maintenance, 11: 10280
major rupture and core meltdown, safety, 11: 10291(R)
pressure tests, 11: 240, 1501
pressure vessel testing program, outline, 11: 3079
pressurizers, mathematical analysis, 11: 4099
reactivity and criticality studies, 11: 8716(R)
reactivity effect of fuel element expansion on cold startup, 11: 11416
refueling and handling equipment system, 11: 5595
relative stability of boiling and, 11: 6913(J)
safety in core meltdown, leaks, ruptures, and crud radioactivity, 11: 12897(R)
seed core configurations, preliminary designs, 11: 10987(R)
start-up simulation by electronic analog computer, 11: 6911(J)
steam demand effect in, 11: 6812(J)
temperature, power, and reactivity transients, 11: 8719(R)
temperature coefficient of reactivity, 11: 11806(R)
test program, 11: 240, 2124
three-group analysis of seed and blanket design and critical experiments, 11: 8720(R)
use of UO_2 as a bulk fuel material for, 11: 11012
valve design for, 11: 673(J)

Pressurizers
(See also Compressors.)
composition of solids removed from HRT-mock-up, 11: 12542
design features of HRT, relationship to reactor safety, 11: 8633
design of modified HRT, 11: 10940
efficiency of HRT, 11: 2108, 2669, 3064, 4081, 7320
gas generation in HRE, 11: 7751
mathematical analysis for reactor application, 11: 4099
performance of Greer hydraulics accumulators, 11: 3790
thermal insulation, 11: 8657

Princeton Univ., N. J.
progress reports on fall-out monitoring, 11: 1749(R)
progress reports on heat transfer in oscillating flow, 11: 239(R)

Princeton Univ., N. J. Frick Chemical Lab.
progress reports on analytical chemistry, 11: 2371(R)

Probes
See Electric probes; Leak detectors.

Processes
(See specific processes.)

Prodigiosine
tissue distribution, 11: 13565(R)

Production reactors
air cooled, graphite moderated, natural U, design, 11: 667(J)
delayed neutron intensities in K-49, 11: 8611
design, method of determining the number of production tubes in, 11: 8670
design and development, 11: 9849, 11778(R), 13966(R)
design of light-water cooled, heavy-water moderated, 11: 3261(P)
development of heat exchanger, hydroclone, and sample valve for blanket processing, 11: 12321(R)
fuel consumption rate and Pu production in, calculations, 11: 9481(J)
fuel element temperatures, comparison with NRX Reactor, 11: 13972
fuel solutions, cost factors, 11: 11770
non-aqueous fluid fuel converter, nuclear data and design methods, 11: 11800
plutonium production analysis of, graphical method for, 11: 9762
production of Pu^{239} and Pu^{240} in, kinetics, 11: 8678
theory, 11: 13113(R)
Windscale, problems in maintenance, 11: 6915(J)

Progesterone
metabolism during pregnancy, tracer study, 11: 13229(R)

Promethium
solvent partition in TBP–kerosene–U nitrate systems, 11: 10808
solvent partition of trace amounts during solvent extraction of Th, 11: 8289(R)

Promethium isotopes Pm^{145}
gamma emission and half life, 11: 9587(R)
nuclear properties, 11: 8284(R)

Promethium isotopes Pm^{147}
energy levels, 11: 1278(R)
half life, 11: 1292(J), 3526(J)
internal bremsstrahlung, 11: 4055(J)

Promethium isotopes Pm^{149}
gamma spectra, 11: 11740

Prompt neutrons
diffusion in homogeneous thermal reactors, 11: 9485(J)
from metal critical assemblies, periods, 11: 10311(J)

Proof Test Reactor
See Submarine Intermediate Reactor Experiments.

Propane
bubble chamber design using, 11: 4948(J)
toxicity and explosion hazards, 11: 985

Propane, bromo-
bromine activation in, chemical effects, 11: 4338(J)

1-Propanol
chromatographic separation and identification, 11: 6297(J)

1-Propanol, 2,3-dimercapto-
therapeutic uses in radioelement poisoning, 11: 893

1-Propanol, 2-methyl-
mass transfer with water, 11: 9581(R)

Propellants
See Fluid propellants; Solid propellants.

Propene
oxidation, rate of formation of CO, CO_2 and CH_3CHO in, 11: 2877(J)

Propionic acid
preparation of C^{14}-labeled, 11: 7977

Propionic acid, sodium salts
metabolism, 11: 9591(R)

Propiophenones
polarographic behavior of solutions, cause of prewaves and postwaves, 11: 9231(J)
Proportional detectors
calibration by α-γ coincidence counting, 11: 2987(J)
counting of tritium in glass, 11: 12144(J)
design, 11: 11562(R)
design and performance, 11: 12970(R)
design and performance of x-ray, and 4 π counters, 11: 1475(R)
design for ANL spectrometer, 11: 11739(R)
design for determination of transuranic elements, 11: 2831
design for elevated temperature tests on Mark I BF_3, 11: 2614
design for high school teaching purposes, 11: 7266(J)
design for low-energy measurements with small wall effects, 11: 3967(J)
design of beta, 11: 7430(R)
design of high-pressure, 11: 12158(J)
design of proton recoil, for fast neutron spectrometry, 11: 6829(J)
effects of space-charge in, 11: 10185(J)
end effects, elimination of, 11: 8095(J)
gas filling system of He^3 fast neutron spectrometers, 11: 10172
light emitted during discharge in, 11: 6820(J)
low energy β measurements with, 11: 12330(R)
performance, effects of Compton backscattered photons in, 11: 1689(J)
performance, factors affecting, 11: 487, 4544(R), 5976(J)
performance, temperature dependence of BF_3, 11: 4013(R)
performance for counting disintegrations in electron-capture isotopes, 11: 4169(J)
performance for estimating Pu by α counting, 11: 4564
performance for measuring ionizing power of fast charged particles, 11: 3003(J)
performance for reactor monitoring, 11: 13111
performance in radiometric determination of fission products, 11: 7263
performance in x-ray analysis, 11: 1601(J), 5451(J)
performance of helium filled, under low temperatures, 11: 6481(J)
performance of methane-filled windowless for counting activity of Gd isotopes, 11: 2968
Propulsion
comparison of liquid, nuclear, solar, arc, and ion systems, 11: 12079(J)
by ion thrust, feasibility, 11: 7211
Propulsion Unit Test
See Nuclear aircraft power plants.
Prospecting
(See also Aerial surveying; Exploration; Geophysical prospecting.)
for atomic minerals, identification, staking claims, and evaluation and sale, 11: 3411(J)
Protactinium
analytical determination, 11: 6289(J)
chemical determination of U ore residues, 11: 11493
concentration by recycling through anion-exchange column, 11: 11126(J)
determination in Thorex Process streams, 11: 3697
diffusion in bismuth–thorium slurries, 11: 13885(R)
distribution in liquid and solid phases of Th–Bi alloys, 11: 7734(R)
extraction from solid ThF_4, 11: 13517(J)
gamma pulse height determination in U residues, 11: 4291(J)
Protactinium (cont'd)
ion exchange, 11: 8283(R)
ion exchange separation from Fe^{3+}, Zr, Hf, and Nb, 11: 8282(R)
oxidation–reduction states, 11: 13633(R)
preparation, separation, crystal structure, density, 11: 9578(R)
recovery by solvent extraction and separation from U and Th, 11: 9534(P)
recovery from carbonate-insoluble U ore residues, 11: 11493
recovery from Thorex Process streams, 11: 13019(R)
separation and concentration from irradiated Th compounds, 11: 1001(J)
separation from metal ions by ion exchange, 11: 7430(R)
separation from Th, 11: 11493
separation from Th and U by TBP extraction from HCl solutions, 11: 4370
separation from Th–U–Pa mixtures by cation exchange, 11: 13576(R)
separation from U residues by ion exchange, 11: 2869(J)
solubility in common acids, 11: 11493
solvent extraction behavior, 11: 11493
solvent extraction from irradiated Th, 11: 8357(R)
solvent extraction in Thorex Process, 11: 11606(R)
solvent extraction with diisopropyl carbinol, 11: 7539(R)
sorption on Dowex-1 and elution with HCl–HF solutions, 11: 12339(R)
Protactinium compounds
chemistry of chlorides, oxides, and oxysulfides, 11: 9752(R)
crystal structure, 11: 8541(R)
Protactinium fluorides
sublimation, conditions for, 11: 13577(R)
Protactinium isotopes
thermal neutron cross sections, review, 11: 10245
Protactinium isotopes Pa^{228}
electron capture decay, 11: 3600(J)
Protactinium isotopes Pa^{229}
nuclear properties, 11: 11493
Protactinium isotopes Pa^{231}
fast neutron cross sections, 11: 11564(R)
nuclear properties, 11: 11493
radiochemical determination, 11: 13551(J)
Protactinium isotopes Pa^{232}
nuclear properties, 11: 11493
Protactinium isotopes Pa^{233}
decay, formation of U^{233} by, 11: 7866
effects on regeneration factor of Th^{232}–U^{233} thermal reactors, 11: 9787
electron spectra, 11: 11739(R)
nuclear properties, 11: 11493
production by neutron bombardment of Th^{232}, 11: 8693
production from neutron irradiation of natural Th, 11: 7866
radiometric analysis by Np^{237} decay and Pa^{233} growth, 11: 508(J)
recovery from Thorex Process waste, 11: 7539(R)
recovery in 23 Process, 11: 12393(R)
removal from irradiated ThF_4, 11: 7732(R)
removal from ThF_4 by volatility processes, 11: 7733(R)
separation, 11: 12970(R)
separation and decontamination in Thorex Process, laboratory development studies, 11: 8395(R)

Protective clothing

(See also Clothing.)

decontamination, effectiveness of laundry procedures, 11: 12649

evaluation of gloves for protective enclosures, 11: 10409

laundry monitor for α-contamination, 11: 2988(J)

for personnel handling radioactive isotopes, 11: 3302(J)

plastic suit integrity in tritium atmosphere, 11: 11035

uranium removal during laundering, 11: 12650

Protective ointments

effectiveness as protection against skin burns, and incindiary properties, 11: 835

effectiveness in protection against thermal radiation, 11: 9948

Proteins

(See also Lipoproteins.)

amino acid content, gamma radiation effects on, 11: 5247(J)

biosynthesis, 11: 4781(R)

biosynthesis in rat pancreas, 11: 12642(R)

denaturation, 11: 13565(R)

effects of gamma radiation from Co^{60}, 11: 1736(J)

effects of radiation on, protective effects of sulfhydril compounds, 11: 1807(J)

hydrogen bonding in, isotopic exchange studies, 11: 1568(J)

labeled with At^{211}, preparation, 11: 12(R)

labeled with I^{131}, preparation, 11: 7152(J)

macromolecules, physical properties, 11: 1725(R)

metabolism, effects of B particles from P^{32}, 11: 3664(J)

metabolism in radiation sickness, 11: 13242(J)

oxidation induced by x-ray and ultraviolet irradiation, cysteine or ascorbic acid protection, 11: 1807(J)

radiation chemistry, 11: 960(J)

radiation effects on crystallized, 11: 8860(J)

radioinduced changes in physical and chemical properties, 11: 966(J), 3650

radioinduced magnetic centers, 11: 10029(J)

serum, labeled with I^{131}, preparation, 11: 5132(R)

solutions, effects of γ irradiation, 11: 6283(J)

synthesis in rat bone marrow transplanted into mice, 11: 11883(J)

Protium

See Hydrogen.

Proton beams

current measurement in, 11: 12619(R)

detection of Bevatron, beam induction electrode system for, 11: 6785

external, produced by Cosmotron, 11: 3185(J)

focusing and acceleration of, simultaneous, 11: 6128

produced by high current ion injector, 11: 3591(J)

pulsing and bunching, mathematics of, 11: 6162

scattering by gases in synchrotrons, 11: 3103

velocities of center of mass, 11: 2993

Proton cross sections

for elastic scattering from Ni and Cu, 11: 2092(J)

for (p,xn) reactions in heavy nuclei, 11: 688(J), 689(J)

measurements in elastic and inelastic p-p scattering at 460, 560, and 660 Mev, 11: 1365(J)

Proton fission

cross sections for Bi, Th, and U, 11: 1279(J)

Proton-scattering analysis

on data from Ni^{58}, Ni^{60}, Ag, Mn^{55}, and Co^{59}, 11: 9186(R)

Proton-scattering analysis (cont'd)

phase shift of (p,p) data from 18 to 260 Mev, 11: 9151(J)

theory and applications, 11: 107

Proton scattering cross sections

measurements for medium Z nuclei, 11: 1542(R)

Proton showers

observation in photographic emulsions, 11: 1931(J)

Proton sources

operation and performance of a high-current r-f injector for an MTA-type accelerator, 11: 7872

Proton synchrotrons

See Synchrotrons.

Protons

(See also Antiprotons; Cosmic protons; Photoprotons.)

angular distribution and elastic scattering with initial energy of 5.4 Mev, 11: 2178(J)

angular distributions of, from α reactions in B^{10}, Al^{27}, and P^{31}, 11: 6113(J)

angular momentum and spatial distribution in nuclei, effect of density distribution, 11: 2211

annihilation cross sections, 11: 13483(J)

in aromatic compounds, nuclear spin-spin coupling, contribution of π-electrons, 11: 10227(J)

attenuation of 19.8 Mev, by various metal foils, 11: 9451(J)

binding energy in heavy nuclei, variation, 11: 4068(J)

bremsstrahlung from 30- to 140-Mev, cross sections for γ ray production from, 11: 6021(J)

collision with gas molecules, effective cross sections, 11: 2177(J)

collosions with protons, production of π mesons in, 11: 4599(J), 5474(J)

collisions with protons at 925 Mev, quasi elastic, 11: 5653(J)

correlations effect on scattering of high-energy electrons from nuclei, 11: 9083(J)

Coulomb excitation by, 11: 692(J), 6127

deuteron scattering by, 11: 10708(J)

diffusion of 3.8 Mev tritons by, 11: 9503(J)

disintegration of heavy elements produced by 5.7-Bev, Li^8 emission from, 11: 5624(J)

disintegration of light nuclei by 1400 ± 6 Mev, 11: 9059(J)

distribution function, 11: 396(J)

distribution in Pb, 11: 1652(J)

effects on dry spores of B. subtilis, 11: 11867(J)

elastic and inelastic scattering by Mg, 11: 8210(J)

elastic and inelastic scattering of polarized, by carbon, 11: 12286(J)

elastic scattering by Be^9, F^{19}, and Na^{23}, 11: 1680(J)

elastic scattering by Be^9 from 200 to 3000 kev, 11: 3043(J)

elastic scattering by N^{14}, 11: 4048(J), 4051(J)

elastic scattering by pions, measurement in nuclear emulsions, 11: 10342(J)

elastic scattering by protons and neutrons at 315 Mev, polarization in, 11: 4153(J)

elastic scattering by protons at energy levels of 460, 560, and 660 Mev with small angular distribution, 11: 1365(J)

elastic scattering by protons at 925 Mev, 11: 5652(J)

elastic scattering by protons at 2.24, 4.40, and 6.15 Bev, 11: 12922(J)

elastic scattering by tritium, mathematical analysis, 11: 2093(J)

elastic scattering from Na^{23}, 11: 1296(J)

elastic scattering of gamma-quanta by, up to 120 Mev, 11: 6135(J)

Protons (cont'd)
elastic scattering of 7.55-Mev, by various elements, 11: 5365(R)
elastic scattering of 17- and 31.5-Mev, diffuse-surface optical model analysis, 11: 8209(J)
elastic scattering of 310-Mev π^+ mesons from, 11: 4734(J)
electron capture, effective cross sections, 11: 2177(J)
electron capture by, passing through H, 11: 5060(J)
electron interactions, π-meson formation in, 11: 1609
electron scattering by, proton polarizability correction to, 11: 6957(J)
electron scattering from, absolute cross section, 11: 3194(J)
energies in high energy collisions of beams of, 11: 2993
energies of, from reactions of 14-Mev neutrons with medium weight nuclei, 11: 5626(J)
energy losses of 37-Mev, statistical fluctuations, 11: 4730(J)
energy spectrum of, from (n,p) reactions in Mg and Zn, 11: 695(J)
excitation of characteristic K x rays from Au and Cu by, 11: 12932(J)
excited states in the proton $f_{7/2}$ shell, 11: 10267(J)
fission of U induced by 147-Mev, angular distribution of neutrons from, 11: 3098(J)
formation of slow mesons by 660-Mev, in photographic emulsion, 11: 3990(J)
gamma angular correlations in $Si^{28}(d,p\,\gamma)Si^{29}$ reaction, 11: 1353(J)
gamma scattering sections below neutral meson threshold, 11: 9069
high-energy kinematics and collisions with photons, electrons, mesons, and protons, 11: 6867
identification in nuclear emulsions, 11: 3960(J), 4118(J)
inelastic scattering at 12 Mev from C, Li, Mg, and Si, 11: 4994(J)
inelastic scattering by C^{12}, 11: 2176(J), 5540(J)
inelastic scattering by deformed nuclei, theory, 11: 7352(J)
inelastic scattering from gold at 6 Mev, 11: 4644(J)
inelastic scattering of 96-Mev, by Li, Be, B, C, N, O, F, Na, Mg, Al, Si, P, S, Cu, Ag, Pb, and Bi, 11: 612(J)
inelastic scattering of 23-Mev, by heavy elements, 11: 6141(J)
interactions, spin-orbit coupling in p-p, 11: 10695(J)
interactions with deuterons at 390 to 650 Mev, total cross section, 11: 3583(J)
interactions with mesons, 11: 1285(J), 3994(J)
interactions with nuclei at 650 Mev, 11: 3528(J)
interactions with pions at 1.4 Bev, study by statistical theory considering formation of isobar states, 11: 2016(J)
ionization of gases by, device for study, 11: 5402
K-meson capture by, correlative phenomena in, 11: 5487(J)
linear accelerator for, characteristics of wave guide for, 11: 2156(J)
linear energy transfer in tissue, 11: 4245(J)
magnetic moment, effect of cut-off limit of meson momentum on, 11: 1386(J)
magnetic moments, in Bohr magnetons, 11: 2044(J)
magnetic resonance, 11: 6039(J), 6040(J)
magnetic shielding in the hydrogen molecule, variational calculation, 11: 1651(J)
mass variation with velocity, review of experimental evidence, 11: 10143(J)
mass when bound in H_2O, 11: 4013(R)
meson production in collisions of protons with, isobar model for, 11: 6850(J)
meson (K^+) production in collisions of protons with, at 3.0 Bev, 11: 5996(J)
meson (π) production by bombardment of Be and C with 660-Mev, 11: 4601(J)

Protons (cont'd)
meson (π^+) production by 340-Mev, Z dependence, 11: 5989(J)
meson scattering by, K^+, 11: 10674(J)
mesons (π^+) produced in p-p collisions at 556 and 657 Mev, energy spectrum, 11: 4600(J)
metabolic effects of, on human pituitary gland, 11: 9973(J)
neutron collisions with, meson production, 11: 5476(J)
neutron scattering, 11: 4709(J), 4728(J), 5663(J)
neutron scattering, saturation of nuclear forces, 11: 13546(J)
neutron scattering by, at 90 Mev, 11: 6955(J)
neutron scattering by, theory, 11: 9081(J)
nonrelativistic, double scattering by nuclei of zero spin, 11: 4065(J)
nuclear internal momentum distribution studied by proton scattering on bound, 11: 595
nuclear paramagnetic resonance in solid cyclohexanol vs. temperature, 11: 10237(J)
nuclear reactions, giant resonance in, 11: 1542(R)
nuclear reactions (p,p'γ), (p,$\alpha\gamma$), (p,n), and (He^3,p), 11: 9189(R)
phase shift analysis of high-energy p-p scattering, 11: 9155(J)
photon scattering by, 11: 9505(J)
photon scattering by, cross sections, 11: 3191(J)
photoproduction of mesons from, kinematics, 11: 548
(π^+) meson scattering by, phase shifts, 11: 6486(J)
pion production in photographic emulsion nuclei by 460-Mev, 11: 3998(J)
pion scattering cross sections, 11: 537(J), 4597(J)
pions from p + p reaction from 400 to 660 Mev, 11: 584(J)
polarization, scattered from C, 11: 5065(J), 6497
polarization in (d,p) reactions, calculations, 11: 6031(J)
polarization in $p + n \rightarrow d + \pi$ reactions, 11: 10759(J)
polarization of, from deuteron stripping in C, 11: 703(J)
polarization of, from reaction $H^2(d,p)H^3$, 11: 6939(J)
polarization of, scattered at energy level of 1.6 to 2.4 Mev, 11: 4145(J)
polarization of, scattered by C^{12}, 11: 1301(J), 4147(J)
polarization of Bev, scattered by complex nuclei, calculations, 11: 8213(J)
polarization of elastically and inelastically scattered, in Ilford G5 emulsion, 11: 1685(J)
polarization of 660-Mev, 11: 3003(J)
polarization of 660 Mev, scattered by nuclei, 11: 12928(J)
polarization produced by quasi-elastic scattering of 315-Mev, 11: 5057
production in nitrogen nucleus interactions with emulsion nuclei, 11: 4720(J)
production of neutral pions by high-energy, 11: 10666(J)
production of π^+ mesons in H by 660 Mev, 11: 12832(J)
proton reactions, formation of mesons and hyperons in, 11: 6493
proton reactions, π-meson formation at 383 Mev, 11: 1262(J)
proton scattering at 650 Mev, elastic/inelastic ratio and meson formation in, 11: 759(J)
proton scattering in emulsions at high energies, 11: 1931(J)
radiative capture by C, 11: 11377(J)
radiative capture in Be, at less than 1 Mev, 11: 3541(J)
radius estimation, 11: 9082(J)
range-energy and range-momentum curves, 11: 12281
range-energy relationship, measurement of, 11: 9752(R)
range in nuclear emulsions of 87-, 118-, and 146-Mev, 11: 6140(J)

Protons (cont'd)

ranges in emulsions in low-energy region, 11: 1182

ranges of 6- to 18-Mev, in Be, Al, Cu, Ag, and Au, 11: 6142(J)

reaction of $pp \rightarrow np\pi^+$, $pp \rightarrow pp\pi^0$ and $pp \rightarrow d\pi^+$ at 660° Mev, 11: 1676

reactions in heavy nuclei at 140-Mev, characteristics, 11: 6123(J)

reactions with antiprotons, energy released, 11: 4027(J)

reactions with neutrons, differential cross sections for bremsstrahlung during, 11: 4201(J)

relaxation in H_2O-D_2O mixtures, 11: 6559(J)

scattering, analysis of 9.8 Mev proton-nucleus, 11: 10347(J)

scattering, diffuse-surface optical model analysis, 11: 8209(J)

scattering, high energy proton-proton, 11: 1684(J)

scattering, nuclear energy level of N^{14} by, 11: 2073(J)

scattering, polarization in p-p, 11: 4144

scattering, relativistic corrections in proton-proton, 11: 6980(J)

scattering, theory of neutron-proton, in presence of noncentral forces, 11: 4150(J)

scattering angle distribution, 11: 10350(J)

scattering at 316 Mev with initial longitudinal spin polarization, 11: 1366(J)

scattering by C and H at medium energies, differential cross sections, 11: 4993(J)

scattering by deformed nuclei, theory, 11: 7352(J)

scattering by He at 7.5 Mev, differential cross section for, 11: 3032(J)

scattering by He^4, N^{14}, and A^{40}, optical model analysis, 11: 10773(J)

scattering by Mg of 9.6 Mev, 11: 1369(J)

scattering by Mg^{24} at 10 Mev, 11: 1368(J)

scattering by neutrons, analysis of polarization, 11: 6951(J)

scattering by neutrons, photographic plate study, 11: 4728(J)

scattering by neutrons at 95 Mev, polarization in, 11: 10341(J)

scattering by neutrons in presence of noncentral forces, 11: 4150(J)

scattering by positive π mesons, D wave effects, 11: 9060(J)

scattering by positive pions at 83 Mev, 11: 10344(J)

scattering by positive pions at 100 Mev, 11: 10343(J)

scattering by protons, coincidence analysis, 11: 13541(J)

scattering by protons, polarization experiments, 11: 13540(J)

scattering by protons, relativistic corrections, 11: 6980(J)

scattering by protons and deuterons, 11: 3003(J)

scattering by protons at 18.2 Mev, pion theory analysis, 11: 7304(J)

scattering by protons at 415 Mev in a bubble chamber, 11: 753(J)

scattering by protons at high-energies, 11: 1684(J)

scattering by protons at 170 and 260 Mev, 11: 747(J)

scattering by protons at 134 Mev, cross sections, 11: 758(J)

scattering by protons at 316 Mev with initial longitudinal spin polarization, 11: 1366(J)

scattering by protons at 310 Mev, phase shift analysis, 11: 4154(J)

scattering by protons in the Bev range, 11: 754(J)

scattering by protons in the presence of non central forces, theory, 11: 6947(J)

scattering from C^{12}, 11: 609(J)

scattering of high-energy electrons by, 11: 2172(J)

Protons (cont'd)

scattering of K^+ particles by, 11: 5988(J)

scattering of 130-Mev neutrons by, differential cross section measured for, 11: 2175(J)

scattering of 139.5-Mev electrons by, measurement of radiative correction to, 11: 5061(J)

scattering of 10- to 35- Mev π^+ mesons by, in diffusion cloud chamber, 11: 3199(J)

scattering of 20-Mev, by O and N, 11: 5058(J)

scattering theory, in the presence of noncentral forces, 11: 6947(J)

spectra of, from $F^{19}(d,p)F^{20}$ reaction, 11: 615(J)

spin relaxation processes in system of two, 11: 3016(J)

strength functions in nuclei, 11: 11383(J)

strength functions in nuclei with A = 44 to 64, 11: 11382(J)

structure, 11: 3003(J)

structure, static theory, 11: 5688(J)

tracks in Ilford G-5 emulsions, fading, 11: 5966(J)

Prototype Power Breeder Reactor
See Argonne Power Breeder Reactor.

Protozoa

growth of rickettsia in embryonate eggs, effects of irradiation, 11: 6199

morphology of Peranema trichophorum observed under the electron microscope, 11: 12642(R)

response of rickettsia to antibiotic therapy, effects of irradiation, 11: 6200

PRP Reactor
See Plutonium Recycle Reactor Experiment.

Public Health Service, Washington, D. C.

reports of waste disposal seminar, Dec. 1955, at Cincinnati, 11: 1026

Pulmonary absorption

effect of particle size, 11: 8259(R), 9576(R)

of radioactive particles, 11: 1726(J)

of simulated fission products in mice, 11: 52(J)

tracer techniques, 11: 13566(R)

Pulmonary edema

following exposure to air blast, 11: 8258(R)

Pulse analyzers

circuits designed for, 11: 5413(J)

circuits designed for reduction of time jitter in output of single channel, 11: 4542

circuits designed for 1024-channel, 11: 1597(J), 4685(R)

circuits designed for 256-channel, 11: 1561

circuits designed to measure short half-life activities, 11: 1222, 1254(J)

design, 11: 5414(J), 6482(J), 9587(R), 13197(R)

design and performance of a stepping single-channel, 11: 504(J)

design for nuclear metastable state decay measurement, 11: 5447(J)

design of fast-differential, 11: 9406(J)

design of gated, 11: 8730(R)

design of multichannel, 11: 1275(R), 3472(J), 3920(J), 5110(P), 5119(P), 6791(J)

design of multi-channel, differential, 11: 7037(P)

Pulse analyzers (cont'd)

design of pulse amplitude selector with constant analysis time, 11: 6789

design of 200-channel electronic, for time-of-flight neutron spectrometry, 11: 11327

design with 10 memory units, 11: 6456

development of 2000 channel, 11: 7292(R)

for electromagnetic radiations and alpha particles, 11: 9373(J)

measurement of correlation functions for two computer channels, 11: 12112(J)

millimicrosecond time-to-pulse-height converter using an r-f vernier, 11: 8978(J)

modifications to the Wilkinson multichannel amplitude, 11: 13393(J)

multichannel, proceedings of conference on, 11: 8075

performance, 11: 8283(R)

performance of, designed for use with radiation detection instruments, 11: 5116(P)

performance of ten-channel, 11: 1967(J)

precision pulse generator for calibration, 11: 6787(J)

pulse amplitude storage system for use with, feasibility, 11: 5439

time-jitter adapter for single channel, 11: 8117(R)

timing circuits for, 11: 11300

Pulse columns

application of differential pressure transmitters in bottom interface control systems, 11: 12700

application to Purex Process, design and performance, 11: 11973

application to recovery of U from waste solutions, 11: 11640

concatenated, description, 11: 192(J)

concatenated, design and operation in Thorex plant, 11: 7417(R)

countercurrent flow, vertical, for Redox and TBP processes, 11: 2341

design, 11: 13638(R)

design and accessories for Thorex pilot plant, 11: 7490

design and efficiency, temperature effects, 11: 8316

design and operation for Zr purification, 11: 13008

evaluation for use in radiochemical plants, 11: 12701

extraction efficiency of a one-in. diameter, 11: 1810(R)

flooding characteristics, 11: 13517(J)

interfacial crud removal, and steam operation, 11: 12965(R)

operating conditions for U recovery from waste solutions, 11: 11641

performance, 11: 8333, 14020(R)

performance in U extraction, effects of temperature on, 11: 8375

performance for separation of Hf from Zr, 11: 12378

performance of Redox Process, 11: 8370

performance of 12 in.-diameter Higgins, 11: 9257

performance using SIR and STR feed solutions, 11: 7530

piping between pulse generator and, in Redox Process, 11: 2342

pressure and power calculation methods, 11: 2334

pulse generator operation, 11: 7966

pulse transmission, 11: 3378

Pulse columns (cont'd)

testing, 11: 13197(R)

testing for Slurex Process, 11: 8335

testing in scrub and strip operations of Slurex Process, 11: 12988

testing with Slurex Process feed, 11: 8272

of Thorex Process, description, 11: 8357(R)

Pulse counters

See Counting devices; Radiation detection instruments (pulse type); Radiation detectors.

Pulse generators (electronics)

design, 11: 8283(R), 12970(R)

design and testing of low-voltage arc and spark, 11: 10618(J)

design for a ten-channel time analyzer, 11: 1224(J)

design for exciting Kerr cell as high-speed camera shutter, 11: 7034(P)

design for magnetizing ferromagnetic devices, 11: 12108

design for use with Harwell 15-Mev linear accelerator and associated neutron time-of-flight equipment, 11: 4534

design of coaxial coupling chamber for thyratron, 11: 5112(P)

design of Hg relay, 11: 4544(J)

design of ion beam chopper for time-of-flight measurements, 11: 2962

design of normal, for measurement of short time intervals, 11: 12119(J)

design of portable battery-operated, 11: 2415

design with constant frequency a-c output, 11: 3253(P)

design with soft iron plunger and electromagnet drive, 11: 11524(P)

development of precision, 11: 6787(J)

precise time intervals, development for, 11: 2571

pulse-lengthener circuits, 11: 5413(J)

Pulse generators (hydraulics)

calculations of gas formation in suction line, 11: 2458

design and development, 11: 13638(R)

operating characteristics of Purex Plant, 11: 5295

piping between pulse column and, in Redox Process, 11: 2342

piston construction and drive systems, 11: 7451(R)

testing in concentrated columns, 11: 7507(R)

Pulse generators (pneumatics)

piston construction and drive systems, 11: 7451(R)

testing, feasibility of steam operated, 11: 12993(R)

Pulse modifiers

millimicrosecond pulse-shaping circuit for, 11: 12120(J)

Pulse transformers

design with small leakage inductance and distributed capacitance, 11: 11551(P)

Pumpkin Buttes Area (Wyo.)

preliminary geologic map showing location of U occurrences, 11: 9296(J)

Pumps

(See also Blowers; Centrifugal pumps; Compressors; Diaphragm pumps; Diffusion pumps; Electromagnetic pumps; Ion pumps; Jet pumps; Metering pumps; Rotary pumps; Vacuum pumps.)

Pumps (cont'd)

air lift, uses for radioactive solution metering, 11: 1059

bearing materials screening, 11: 3800

buyers' guide tables, 11: 10070(J)

calculations of gas formation in suction line of pulsafeeder, 11: 2458

canned motor, bearing load measurement device, 11: 1057

canned-rotor, testing, 11: 7734(R)

cavitation in, 11: 12451

corrosion by $CuSO_4-H_2SO_4-UO_2SO_4$, 11: 9287

cylinder assembly for use where sealing is subjected to high pressure differential, 11: 7014(P)

design and operation for pumping ThO_2–water slurries, 11: 13355

design and performance of turbine and canned motor, 11: 11174

design and testing of, for HRE, 11: 8708(R)

design and testing of HRT, 11: 7859(R), 9869(R)

design for by-pass systems for Hanford CG-558 process-water, 11: 5848

design for fused salt loop, 11: 13316

design for HRE, 11: 7857(R)

design for toxic fluid transfer, 11: 7389(P)

design for use in nuclear reactors and associated process plants, 11: 10069(J)

design of air-operated, for continuous in-line sampling, 11: 12021

design of bellows-type and diaphragm for homogeneous boiling reactors, 11: 2459

design of compressor, for pressures up to 3,000 psi, 11: 4838(J)

design of high-pressure, for gases and liquids, 11: 5304(J)

design of liquid piston, with small gas containment, 11: 5099(P)

design of reactor coolant, 11: 5832(J)

design with improved sealing arrangement, 11: 9541(P)

development of HRE, 11: 11801(R)

erosion of impeller and flow nozzle by ThO_2 slurries, 11: 9469

examination of stainless steel diaphragms from pulse-feeder, 11: 9710

failure of pulsafeeder and purge, in HRT mockup, 11: 8642

flow measurements on HRT, 11: 10942

for Homogeneous Reactor Project, survey, 11: 7767

impellers, fabrication of Ti, 11: 12585(R)

materials, testing of Al_2O_3 and WC coatings of bearings for ThO_2 slurry, 11: 8900

molecular, theory, 11: 6346

motor combinations, 11: 7390(P)

oil-free, design and performance, 11: 13317

performance of, for EBR systems, 11: 6521(R)

performance of air-lift, evaluation for radiochemical processing facilities, 11: 7170

Pumps (cont'd)

performance of circulating, pulsafeeder and purge, in HRT mock-up, 11: 11771

performance of HRT, 11: 2460, 2461, 2463

performance of portable, for sampling test wells, 11: 12725

pulsafeeder, experimental stress analysis, 11: 2462

radiation effects on 400-A HRT motor circulating, 11: 6958

safety studies of HRE soup recirculating, 11: 8582

stress corrosion in HRT mockup, 11: 9288

test data, 11: 3913

test results on large reactor coolant, 11: 2466

testing, for Redox Process application, 11: 8366(R)

testing of air lift and pulse, for Hope Project, 11: 13644(R)

testing of HRT boiler feedwater, 11: 10931

testing of water coolant passages of 75 psi electromagnetic, 11: 12449

testing of WAPD coolant, 11: 2731, 3801

testing of Westinghouse 30-A, 11: 12321(R)

tests and results on Westinghouse canned-rotor, for HRT, 11: 9709

theory of steam-jet, 11: 7171(J)

wear resistance after 580 hours, 11: 2467

Pumps (liquid metal)

(See also Electromagnetic pumps.)

analysis of the electromechanics of a centrifugal d-c actuated electromagnetic, 11: 2464

cleaning of Na centrifugal, 11: 4095(R)

design, 11: 7599(R), 11742(R), 13982(R)

design and development considerations, 11: 7982(J)

design and performance, effect of cavitation limit on, 11: 5849

design and performance for use in reactors, 11: 10068(J)

design considerations and survey of U.K.A.E.A.-developed, 11: 5305(J)

design for molten Bi, 11: 2895

design of single-phase electromagnetic, 11: 11519(P)

development, 11: 2465, 2892, 11747(R)

performance of EBR-II, 11: 11748(R)

pressure gages for, design, 11: 2437

production of canned-motor, 11: 10066(J)

testing, 11: 8707(R)

testing of Na, 11: 8686(R)

Punched card methods
See Indexes.

Purdue Research Foundation, Lafayette, Inc.

progress reports on fluorocarbons, 11: 2286(R)

progress reports on synchrotron research, 11: 12916(R)

Purex Process

(See also Tributyl Phosphate Process (Canada).)

accident report of explosion in TNX evaporator, 11: 8364

acid, uranium, and waste concentrators, field corrosion tests in, 11: 271

analytical control manual, 11: 11585

application of pulse columns to, 11: 11973

application to Np recovery from metal waste, 11: 8286(R)

application to ORNL metal waste recovery, 11: 12401

comparison of U and Pu recovery in mixer-settlers and pulse columns, 11: 11604

corrosion of austenitic stainless steels by acid concentrators, 11: 8374

corrosion of steel in waste streams from, 11: 7734(R)

cost, effect of plant size on, 11: 13020

decontamination of equipment at ORNL, 11: 13018

design of piping between columns and generators, 11: 2342

development, 11: 13197(R)

development studies, 11: 8706(R)

equipment, 11: 2329

equipment, corrosive effects of HNO_3 and $UO_2(NO_3)_2$ on, 11: 7616

equipment and first extraction, 11: 7482

equipment operation experience, effect on plant design, 11: 7965

extraction column operating characteristics, 11: 7483

extraction equipment, pulse generator operation, 11: 7966

feed preparation from Zr-clad U fuel plates, 11: 11643

fission-product activities and solvent damage rates, calculations, 11: 13645

flowsheets and decontamination of equipment, 11: 5204(J)

gas disposal jets, hydraulic characteristics, 11: 7162

head-end treatment with $KMnO_4$ to remove Ru, Zr, and Nb, 11: 12375

losses of materials, 11: 7708(R)

metal solution, 11: 8288(R)

modified, for processing MTA target plates, 11: 14020(R)

multi-stage evaporation of acid wastes, 11: 7590

nitric acid recovery, 11: 11568

nitric acid recovery, volatilization of Ru in, 11: 8376

nitroalkane formation during irradiation, 11: 8320

performance of turbomixer for continuous washing of organic solvent, 11: 11977

pilot-plant flowsheets, 11: 7480

plutonium isolation from HBP streams, 11: 8334

plutonium-recovery flowsheets, 11: 7507(R)

plutonium stripping in, effect of TBP hydrolysis on, 11: 9661

Purex Process (cont'd)

pulse generator operating characteristics, 11: 5295

ruthenium distillation in acid waste evaporation, 11: 7491

second uranium cycle and decontamination, 11: 11605

second U extraction, use of first cycle solvent in, 11: 11610

solution quality control by in-line instrumentation, 11: 4544(R)

solvent extraction of Pu in, 11: 11600

solvent extraction reprocessing method for irradiated U, 11: 11972

solvent flammability, 11: 3360

solvent processing, 11: 7557

solvent recovery from, by contacting with $Ca(OH)_2$ slurry, 11: 7489

solvents, 11: 8371, 13982(R)

stud and flange failure in equipment, 11: 7161

volatilization of Ru during HNO_3 recovery, 11: 8376

waste disposal, 11: 7594(R), 7734(R), 12386, 13043(R)

waste disposal, ion exchange decontamination, 11: 11631

waste processing by ion exchange, 11: 11630(R)

zirconium-niobium extraction by TBP, effects of H_3PO_4 on, 11: 13666

Purification equipment
See Water purification equipment.

Purines

metabolism of C^{14}-labeled guanine and azaguanine, 11: 9591(R)

PWR
See Shippingport Pressurized Water Reactor.

Pyrex
See Borosilicate glass.

Pyridines

reaction with boric acid, 11: 1922(R)

Pyrimidines

radiolysis, protective effects of sulfhydryl compounds, 11: 4332

Pyrometallurgical processes
See Alloy separation processes; High temperature separation processes.

Pyrometry

(See also Thermometry.)

in reactors, methods, 11: 10149

4-Pyrone, 5-hydroxy-2-(hydroxymethyl)-

reaction with Schiff's bases, 11: 5195(J)

Pyrophoricity

of molten zirconium with H_2O, 11: 3394(R)

of plutonium, U, Th, Zr, and Hf, 11: 2934(J)

Pyrophosphates

radiation effects on, in quartz, lime, and glass, 11: 12642(R)

Q

Quadrupole moments
See Electric moments; Magnetic moments.

Quantometers
(See also Spectrometers.)
performance, 11: 10811(R)

Quantometric analysis
See Spectroscopy.

Quantum electrodynamics
(See also Field theory; Quantum mechanics.)
boson family from quantized finite-particle Maxwell theory, 11: 10384(J)
field theories, formulation of quantized, 11: 12945(J)
improved formulas in perturbation theory, effect of renormalization group on, 11: 802(J)
manuals, 11: 11487(J)
mathematical consistency, 11: 3003(J)
renormalization groups, 11: 803(J)
testing by electron-electron scattering, 11: 12783

Quantum mechanics
(See also Mathematics; Physics; Quantum electrodynamics.)
continuous groups in, algebra of, 11: 4561
distribution functions, temperature dependence in statistical, 11: 10792(J)
dynamic and statistical relationships in atomic phenomena, 11: 8242(J)
energy loss of fast charged particles, 11: 12307(J)
ergodic theorem for interacting systems, 11: 11488(J)
exponentially decaying states, theory of, 11: 4016(R)
field theory of unstable particles, 11: 13558(J)
four-dimensional isobaric spin formalisms, 11: 12306(J)
group theory in solid body physics, review, 11: 4211(J)
induction decay shape theory, 11: 10694(J)
mass-energy relation in, 11: 6866(R)
method of moments, 11: 13556(J)
relativistic invariance, analysis, 11: 6170(J)
theory of, book, 11: 810(J)
theory of angular momentum, 11: 11248
transitions of a system of coupled angular moments, 11: 807(J)

Quantum physics
See Nuclear physics.

Quartz
(See also Sands; Silicon oxides.)
adsorption of inorganic ions on, 11: 6237(R)
density changes in, by neutron irradiation, 11: 2188(J)
flotation, effect of slime, 11: 4861(R)
paramagnetic resonance in, irradiated with fast neutrons, 11: 1691(J)
paramagnetic resonance of crystals, 11: 1922(R)
pile irradiation effects on, 11: 11564(R)
radiation damage in, optical effects, 11: 3599(J)
radiation damage observed by ultrasonic attenuation and velocity measurements, 11: 762
radiation effects, 11: 7455(R), 13578(R)
radiation effects under fast neutron irradiation, 11: 6961(J)
solubility in HCl and HI and adsorption of inorganic ions on, 11: 4861(R)

Quartz (cont'd)
solubility in HF, and adsorption of Cl ions, 11: 3784
solubility in superheated steam, 11: 8029(J)
in solutions of HI, HCl, and HBr, Zeta potential of, 11: 6237(R)
structure of neutron-irradiated, determined by x-ray-diffraction analysis and infrared spectroscopy, 11: 6973(J)
thermal capacity, 11: 4817
thermal conductivity, 11: 4817
for use in ionization chamber construction, radiation effects, 11: 2456

Quartz crystals
radiation effects, 11: 1922(R)
radiation effects on near infra-red absorption spectrum of α-, 11: 12097(J)

Quartz fibers
fabrication for remote-controlled microbalance, 11: 458
measurements of thickness using electron diffraction analysis, 11: 11331(J)
mechanical properties of spun, 11: 460(J)
mechanical spinning for radiometers, 11: 460(J)

Quercetin
color reaction with Th in spectrophotometric determination of Th, 11: 13273(J)

Quinalizarin
analytical use in spectrophotometric determination of boron in heat-resisting alloys, 11: 8848(J)

8-Quinolinol
analytical uses for U precipitation, 11: 2277
radiation effects, 11: 4349(J)
uranium recovery by extraction with, 11: 991

R

Rabbits
effects of head irradiation on blood pressure, brain water content, and cerebral histology, 11: 858(J)
hair growth stimulated by exposure to x irradiation, 11: 8778(J)
skin response in irradiated, 11: 3660(J)
x-radiation effects on placentary barrier penetrability at different periods of pregnancy, 11: 13235(J)

Radar
(See also Microwaves.)
fabrication of ceramic radomes for, 11: 11178
physics, 11: 2551

Radiation
(See also specific types of radiation, e.g., Gamma radiation; X radiation.)
acetylcholinesterase inactivation exposure to electrons, protons, or α particles, 11: 2781(J)
angular correlation analysis in nuclear bombardment experiments, coefficients for triple, 11: 9051
angular correlation of, with parallel angular momenta, 11: 9064(J)
applications in cancer therapy, 11: 7081(J)
applications in the national economy and science in the U.S.S.R., conference, 11: 11016(J)
atmosphere supported by, kinetic temperature, 11: 11274(J)

Radiation (cont'd)
atomic displacement from irradiation in solids, theory, 11: 12504(R)
from atomic explosion at Hiroshima, pathological effects on children, 11: 8763
attenuation by standard Navy barracks and underground shelters, 11: 12652
attenuation in inhomogeneous media, 11: 7216(J)
background emissions, bibliography, 11: 50
biological effects, 11: 52(R), 4781(R), 8261(R), 9923(J), 10803(R), 11556(R)
biological effects, a review of target and hit theories, 11: 12644
biological effects, influence of alcohol on, 11: 8800(J)
biological effects, review, 11: 6207
biological effects of, from fall-out, bibliography, 11: 51
biological effects of, from nuclear explosions, 11: 9206(J)
biological effects of nuclear, 11: 9955(J)
biological effects of K^{40}, on animals, 11: 8771(J)
biological effects of single and chronic doses of, conference on, 11: 10404(J)
biological effects on experimental animals, 11: 3274(R)
biological effects on plants and animals, 11: 44(J)
calorific determination of half-lives and comparison of radium standards, 11: 12140(J)
cancer in man induced by exposure to, 11: 11850(J)
carcinogenic effects of ionizing, review, 11: 2786(J)
carcinogenicity, review, 11: 1392
cataracts induced by exposure to, relationship to dose, 11: 6599(J)
changes in pituitary gland in frogs induced by whole-body exposure, 11: 4790(J)
chemical effects on composition of blood serum and isolated serum lipoproteins, 11: 8259(R)
chromosome aberrations in Tradescantia induced by exposure, 11: 8775(J)
chromosome aberrations induced by, 11: 5158(J)
commercial application for processing, economic aspects, 11: 10028(J)
control of insect pests by exposure, 11: 873(J)
cytological effects, 11: 5170(J)
cytological effects on animal marrow, 11: 3656(J)
degradation of tri-n-butyl phosphate by exposure, 11: 5243(J)
depth dose measurements in the presence of interposed bone, 11: 4938(J)
detection and measurement, 11: 1585(J)
detection and measurement, design of survey meter, 11: 1242
detection and measurement, energy and geometry factors in surface dosimetry, 11: 1979
detection and measurement, standard methods used at the National Physical Laboratory, 11: 6842(J)
detection and measurement of small amounts in samples of atmosphere, soils, and surface water, 11: 6817
detection techniques for low level, 11: 5499(J)
dosage determinations, 11: 1608(J)
dosage determinations, design of isodose plotter for calculations, 11: 2982(J)
dosage determinations, effect of exposure geometry on, 11: 8780(J)
dosage determinations, graphs and tables for use in computing, 11: 11902(J)
dosage determinations and pathological effects of, from internally deposited uranium, 11: 8815

Radiation (cont'd)
dosage determinations and permissible limits, 11: 2796
dosage determinations for fall-out for nuclear explosions, 11: 6470
dosage determinations for ground crew working on radioactive jet engine systems panel, 11: 10174
dosage determinations for interstitial implants, 11: 4589(J)
dosage determinations for laboratory animals, 11: 4224
dosage determinations for whole-body exposure following uncontrolled fission reactions, 11: 3301(J)
dosage determinations in ovaries from I^{131} used for radiotherapy, 11: 12147(J)
dosage measurements, tissue-equivalent phantom material for, 11: 1607(J)
dose or flux rate of, variation with density, 11: 552
effectiveness of x and ultraviolet, in producing mutations in maize, 11: 13239(J)
effects of exposure of food on wholesomeness, 11: 1723(R)
effects of exposure on histamine excretion and work capacity in rats and blood serum Fe levels in rabbits, 11: 1725(R)
effects of exposure on levels of creatinine in blood plasma and urine in rats, 11: 12640
effects of exposure on poliomyelitis virus, 11: 5715(J)
effects of ionizing, on antibody formation, 11: 11026(J)
effects of ionizing, on proteins in cytoplasm of liver cells, 11: 13242(J)
effects of lethal doses on nervous system and blood pressure in rabbits, 11: 7058(J)
effects of local exposure on digestive organs in, 11: 7912(J)
effects of repeated exposures on development of protective adaptation reactions in rabbits, 11: 9927(J)
effects on blood and tissue cholinesterase levels in irradiated animals, 11: 3281(J)
effects on blood plasma Fe levels in rabbits, 11: 2233(R)
effects on blood pressure of rabbits, 11: 5724(J)
effects on body composition of man, influence of vitamin B and diet, 11: 5152(J)
effects on bone-growth development on injured sections of radius bones of rabbits, 11: 3311(J)
effects on cell metabolism, 11: 6611(J)
effects on closed fracture healing in rabbits, 11: 6152(J)
effects on creatinine synthesis in dogs, tracer study, 11: 13231
effects on eggs and spermatozoa of Habrobracon, effects of anoxia, 11: 5719(J)
effects on foodstuffs, 11: 1396(J)
effects on functions of cerebral cortex, 11: 6151(J)
effects on genetics and mutations of organisms, 11: 10405(J)
effects on growth and development of Drosophila in food exposed to high levels of, 11: 6597
effects on hematopoietic system in white mice protected by carbon monoxide, 11: 10401(J)
effects on hereditary factor of man, 11: 11860(J)
effects on injured intestines of rabbits, 11: 5726(J)
effects on kidney alkaline phosphatase activity, 11: 8788(J)
effects on nervous system of fowls, 11: 11032(J)
effects on olfactory nervous system in people, 11: 7057(J)
effects on organism reactions to barbiturates and other drugs, 11: 3282(J)
effects on physical and chemical properties of proteins, 11: 966(J)
effects on plants, 11: 17(J), 3657(J)

Radiation (cont'd)

effects on rabbit response to toxoids, 11: 7060(J)

effects on skeletal uptake of Sr in dogs, 11: 5133(R)

effects on skin epithelium, 11: 3661(J)

effects on synthesis of desoxyribose nucleic acid and mitotic activity in mouse liver, 11: 20

effects on urea metabolism in rats, 11: 5132(R)

electromagnetic multipole, theory, 11: 9444(J)

energy dissipation characteristics in water calculated for x, γ, β, and α particles, 11: 5978(J)

exposure limits, 11: 3304(J)

fields, rotation and angular momentum of multiple, 11: 2942(J)

fluxes in cylindrical cavity from an idealized entering current, 11: 4931

food preservation with, 11: 3287(J)

genetic effects, 11: 875(J), 880(J), 9941(J), 9387(R)

genetic effects in female mice, 11: 5157(J)

genetic effects in man, 11: 11862(J)

genetic effects of exposure on man, 11: 9939(J)

genetic effects on children of parents exposed during the atomic bombings of Hiroshima and Nagasaki, 11: 3294(J)

genetic effects on Drosophila Melanogaster, 11: 9932(J)

genetic effects on sensitivity of mice exposed to, 11: 11852(J)

glass coloration induced by, 11: 6281

gonad dose determination in males and females during radiodiagnosis, 11: 9919(J)

hazards from fall-out from atomic explosions, 11: 3307(J)

hazards to children, 11: 2798(J)

hazards to man, review, 11: 55(J)

hazards to veterinarians from exposure during radiography, 11: 1754(J)

health protection of workers, 11: 56(J)

hematological effects of, in rabbits, 11: 853(J)

high energy utilization in food processing and preservation, instruments for, 11: 2775(J)

industrial applications, 11: 13225(J)

industrial applications, lecture notes, 11: 6931(J)

influence on aging processes, 11: 9940(J), 9941(J)

influence on psychological stress in military personnel, 11: 7048

intensities and selection rules of multipole, 11: 4967(J)

interaction calculations, 11: 5662(J)

ionizing, delayed pathological effects on humans and animals, 11: 5722(J)

ionizing, effects on microörganisms, 11: 3279(J)

ionizing, effects on the optic nerve of rabbits, 11: 2785(J)

ionizing, mechanisms and specificity of biological effects, 11: 848(J)

from large doses of I^{131} in rats, effects on basal metabolism, 11: 842(J)

leukemia induced by exposure, 11: 7064(J)

lymphocyte abnormalities in man following chronic low-level exposure, 11: 9936(J)

maximum permissible dose from isotopes of medical interest, 11: 1404(J)

maximum permissible exposure levels for man, 11: 4256(J)

monitoring in Bikini Atoll Test, 11: 9206(J)

mutations in mice induced by exposure, 11: 8774(J)

mutations in plants, 11: 8762

Radiation (cont'd)

mutations produced in wheat following exposure of seed to x radiation and thermal neutrons, 11: 1399

paramagnetic resonance absorption, 11: 7455(R)

pathogenic effects on bone marrow in mice, 11: 11844(J)

pathogenic effects on pregnancy and labor in rats, 11: 10403(J)

pathological effects, 11: 1392

pathological effects in mice, 11: 4783, 4786(J)

pathological effects in plants and animals, 11: 5753(J)

pathological effects of, from thermonuclear explosion, 11: 834

pathological effects of exposure on man, 11: 9938(J)

pathological effects on brain of rabbits, 11: 5718(J)

pathological effects on hyaluronidase and hystamine level in blood of exposed personnel, 11: 9929(J)

pathological effects on introceptive unconditioned reflexes in animal organisms, 11: 9926(J)

pathological effects on laboratory animals, 11: 4224

pathological effects on nuclein exchange in liver, 11: 10400(J)

permissible dose problems, 11: 56(J)

permissible limits for man, 11: 9939(J), 9940(J), 10191(J)

physiological effects, as demonstrated by creatinuria in irradiated monkeys, 11: 13241(J)

physiological effects of, compared with effects of shock, 11: 7047(J)

physiological effects of, on deoxyribonucleoprotein complex of mice, 11: 8766

from radioactive iodine, effects on goitrogenesis in rats, 11: 4788(J)

radioresistance of mice induced by small doses of preliminary exposure, 11: 3276(J)

reactions with matter, reactor design from, 11: 2129(J)

relative biological effectiveness of ionizing, 11: 5164(J)

scattering calculations, coding UNIVAC for, 11: 11460

scattering with frequency spreading, 11: 8202(J)

sensitivity of tumors to, factors affecting, 11: 25(J), 26(J)

shielding of, from plane circular source, 11: 791(J)

specific absorption capacity, apparatus for determining, 11: 3639(P)

specific energy loss in air, effect on wet muscle tissue, 11: 1946

sprout inhibition in potatoes induced by exposure, 11: 1401

sterility and deformities of beetles induced by exposure, 11: 5143(J)

stimulation effects of small doses of ionizing, on paramecium, 11: 1738(J)

surface dosage determinations, 11: 1979

transport theory, 11: 4563

tumor induced in sheep thyroid gland by, from ingested I^{131}, 11: 11851(J)

tumor induction following exposure of monkeys, 11: 13230

tumors induced by exposure, 11: 8786(J), 8787(J)

Radiation chemistry

(See also Radiochemistry.)

of ammonia, 11: 6669(J)

analytical facilities, 11: 520(J)

applications in the national economy and science in the U.S.S.R., 11: 11016(J)

of aqueous $FeSO_4$ solutions, oxidation yield determination, 11: 2847(J)

of aqueous solutions, 11: 7406(R)

of aqueous solutions as affected by the walls of their vessel, 11: 13624

Radiation chemistry (cont'd)
bibliography, 11: 1462
bibliography containing 884 references, 11: 10488(J)
book on history, scope, applications, 11: 10440(J)
of cellulose, 11: 6673(J)
chemical reactions in the general track composed of n particles, theory 11: 6670(J)
conference of Acad. of Science Chem. Dept. with the Ministry of Chemical Industry, Moscow, Mar. 25-30, 1957, 11: 11955(J)
effects of x rays on ethanol, 11: 6284(J)
of gamma (γ,n) reactions, 11: 5807(J)
of gels, reaction product distribution, 11: 13282
of hexane, 11: 6676(J)
industrial uses, 11: 1462
lab facilities, techniques, and studies, 11: 168(J)
of methionine, 11: 6671(J)
molecular ionization, excitation, and dissociation processes in O, H, C, N, and their simple complexes, 11: 11953(J)
of organic compounds, review, 11: 960(J)
of organic liquids, 11: 13284
oxidation of ferrous ammonium sulfate solutions by electron irradiation, 11: 6672(J)
progress reports from UCRL, 11: 8549(R)
reduction of Ce^{4+} by formic acid induced γ radiation, kinetics, 11: 9252(J)
review, 11: 4334(J)
review of applications in studies on chemical transformations and reactivity of substances, 11: 10488(J)
of water and aqueous solutions, 11: 13623
yields in aerated $FeSO_4$ solutions with cyclotron beams, 11: 5805(J)

Radiation cross sections
See Cross sections.

Radiation damage
(See also Radiation injuries.)
of crystals, as shown by changes in x-ray diffraction pattern, 11: 12975
detection by electron spin resonance apparatus, 11: 3470
detection of directional neutron, in Si by ultrasonic double refraction measurements, 11: 6154(J)
mechanism studies, 11: 10560(R)
method of evaluation of, to mechanical properties of plastics, 11: 12929
monitoring by variation in electric conductivity of graphite, and theory, 11: 9889
theoretical model, 11: 2755
theory, 11: 14026
x-ray-diffraction analysis, 11: 13834(R)

Radiation detection instruments
(See also Radiation detectors; Radiological telemetering systems; Rate meters; Scalers.)
automatic recording, for fall-out γ monitoring, 11: 9404
background and radiocarbon dating, 11: 5977(J)
background of, used in C^{14} age measurements, 11: 5450(J)
beta sensitive personnel dosimeter, 11: 3968(J)
calibration, for dosimetry of kilocurie γ sources, 11: 11321
calibration for use as dosimeters, 11: 519(J)
calorimeter design for determination of ion beam intensities, 11: 9407(J)

Radiation detection instruments (cont'd)
calorimetric, calibration and design, 11: 7826(R)
calorimetric measurements for naturally radioactive elements, 11: 9002(J)
for clinical work, design and performance, 11: 515(J)
delayed-neutron monitors for detection of sheath failures in reactor fuel rods, 11: 8097(J)
descriptions of SPERT-1, 11: 9102
design, 11: 13382(J)
design, construction, service, and operation of α energy analyzer, 11: 2980
design, employing transistors, 11: 3957
design, performance, and calibration of dosimeters, 11: 52(R)
design and applications of, survey, 11: 501(J)
design and development, 11: 8282(R)
design and operation, review, 11: 500(J)
design for detecting and counting the fissions in a sample, 11: 9563(P)
design for determining tissue distribution of radioactive colloids, 11: 9974(J)
design for mapping gamma-emitting tracers and locating thyroid metastases, 11: 5113(P)
design for measuring neutrons in the presence of gamma rays, 11532(P)
design for neutrons in a reactor, 11: 9574(P)
design for reactor monitoring, 11: 10748(J)
design for thermal neutrons, 11: 5438
design of A–He–NH_3-filled gamma ray detector, 11: 9546(P)
design of apparatus with logarithmic scale for measuring γ intensity, 11: 6830(J)
design of γ alarm unit and portable γ dose-rate monitor, 11: 4578(J)
design of hand and foot monitor, 11: 6475(J)
design of transistorized circuits for, 11: 9007(J)
design of well-bottom container for use in γ counting, 11: 10653(J)
design studies on neutron spectrometers, pulse analyzers, and scalers, 11: 551
design to give visual image which is function of incident radiation, 11: 5120(P)
determination of neutron intensity and gamma spectrum of neutron sources, 11: 6825(J)
development, 11: 6494(R)
development at Chalk River, 11: 9054(R)
development of neutron monitors, 11: 9888(R)
electron drift velocities in gases, 11: 4916(J)
energy sensitivity, effects on dose rate measurements, 11: 1979
equipment for study of radioactive cloud, 11: 6823(J)
evaluation and testing, 11: 7694(R)
factors affecting accuracy of data, 11: 1579
for gamma radiation dose rate measurements from Co^{60} source, 11: 9398
gel dosimeters for depth-dose measurements, 11: 7277(J)
health physics instrumentation for power reactors, 11: 9954(J)
hodoscope chamber, 11: 3003(J)
isodose plotting device for, 11: 8975(J)
measurement of radioactive half-lives and comparison of radium standards, 11: 12140(J)
for monitoring waste disposal, 11: 2242(R)

Radiation detection instruments (cont'd)
for neutrons, studies at Argonne, 11: 6824(J)
operation, 11: 5459(J)
over-compression chambers, behavior, 11: 3003(J)
performance, determination of absolute efficiencies, 11: 1585(J)
performance, effects of signal-to-noise ratio, 11: 2596
performance for low-level tracer work, 11: 1256(J)
performance for monitoring fall-out, 11: 51
performance for monitoring gaseous fission products, 11: 1984
performance for monitoring nuclear test aircraft, 11: 11328
performance in gamma ray scanning of spent fuel elements, 11: 12515
power supply design for, 11: 6468
for radiobiological studies, survey, 11: 10194(J)
review of recent improvements in, 11: 9401
self-checking monitor for gamma radiation, thermal neutrons, and airborne radioactivity, 11: 6828(J)
sensitivity vs. maximum permissible intake, 11: 10422(J)
survey, 11: 7275(J)
two-meter crystal diffraction, design, 11: 3485(J)
for use as dosimeters, design, 11: 520(J)

Radiation detection instruments (audio pulse type)
design, 11: 3947

Radiation detection instruments (colorimetric)
design of fast-neutron-insensitive γ dosimeters, 11: 505(J)

Radiation detection instruments (ion current type)
beta sensitive probe and circuits for Samson Survey Meter, 11: 2604
calibration, 11: 513(J)
calibration for T_2 monitoring, 11: 2610
design for the assay of β-emitters, 11: 4934
design of α electroscope for liquid sources, 11: 4565
design of A-filled ionization chamber for gamma source calibration, 11: 5962
design of improved electroscope, 11: 9551(P)
design of portable, easily-maintained, 11: 6835(J)
design of time of arrival device for fall-out monitoring, 11: 11330
gamma sensitive, for flowing liquid, 11: 3481
for measuring radiation doses in r units, 11: 9405(J)
for neutrons, design and performance, 11: 2611
small compact airborne system for γ radiation, 11: 1559

Radiation detection instruments (pulse type)
absolute standardization of β-emitting isotopes using liquid scintillators, 11: 3211(J)
accuracy limits in the measurement of time intervals defined by scintillation counter pulses, 11: 10188(J)
for alpha counting of solid materials of low activity, design, 11: 1603(J)
apparatus for air shower observation, 11: 8954(J)
for beta particle monitoring from tritium, design, 11: 2598
cadmium sulfide cells for x- and γ-ray sensitivity, 11: 509(J)
Cerenkov-photovoltaic, for high-intensity radiation, 11: 5971(J)
component development, 11: 2027(R)
containing a scintillation detector for personnel monitoring, design, 11: 2599
contamination meter, transistor circuit design, 11: 6814
decomposition of 2-propanol quench gas by Geiger-Mueller discharge, 11: 4573(J)

Radiation detection instruments (pulse type) (cont'd)
design, 11: 6592(P), 8283(R)
design, for high range β-γ survey work, 11: 3953
design, for locating burnup in reactor fuel elements, 11: 10663(J)
design and performance for β assay, 11: 1988(J), 1989(J)
design and performance for in vivo monitoring of pig thyroid gland, 11: 6471
design and performance of a stepping single-channel analyzer, 11: 504(J)
design for α-monitoring of waste streams, 11: 5963
design for localization of γ-emitting radioisotopes in vivo, 11: 6473(J)
design for low energy γ, coincidence circuit scintillation, 11: 11738
design for measurement of low level activity in rocks, 11: 12143(J)
design for monitoring air for α particles, 11: 12809
design for neutron flux measurements in reactors, 11: 2606
design for use in in vivo tracer studies, 11: 1584(J)
design of, for gamma angular correlation measurements, 11: 5449(J)
design of, for nuclear metastable state decay measurements, 11: 5447(J)
design of, using integrating sphere and photomultiplier tube, 11: 494(J)
design of α scintillation probe for use with, 11: 3954, 10660(J)
design of automatic, for laboratory sample counting, 11: 4935
design of combined α, β, γ hand and shoe monitor, 11: 3956
design of delay-line that has large area and low capacitance, 11: 5453(J)
design of extended probe survey type, 11: 1239
design of In-foil counter for measurement of neutron flux, 11: 497(J)
design of logarithmic and linear scintillation exposure-rate, 11: 8997
design of low-background, for solid β emitters, 11: 6833(J)
design of multiple-range, 11: 10812(R)
design of noble gas scintillation counter, 11: 9403
design of plastic-well β-ray counter, 11: 1589(J)
design of portable scintillation survey, 11: 1243
design of proton-recoil scintillation, for neutron detection, 11: 2609
design of scintillation counter probe for surgical uses, 11: 1590(J)
design of scintillation spectrometer for very-low-energy γ radiation, 11: 6819
design of transistor detector, 11: 8092(J)
design of transistorized α, β, and γ-survey meter, 11: 1242
design of transistorized G-M survey instrument, 11: 1241
design of well-type scintillation counter, 11: 3955
development, 11: 12639(R)
development of a photoconductive γ dose rate meter, 11: 486(R)
diborane-filled counting tubes for measuring thermal neutrons, 11: 10186(J)
employing gridded ionization chamber, performance for α energy measurements, 11: 485
employing halogen-quenched G-M tubes, effects of negative ion formation on efficiency, 11: 1581
employing large plastic scintillation detector, performance, 11: 1981
employing liquid scintillation detectors, performance for β counting, 11: 7271(J)
employing scintillation detector, design and performance for γ detection in biological materials, 11: 8083(J)
employing scintillation detector, performance for aerial surveying, 11: 5437
employing scintillation detectors, performance and circuit design, 11: 5179(R)
employing scintillation probe, performance in in vivo tracer studies, 11: 5464(J)

Radiation detection instruments (pulse type) (cont'd)
evaluation of monitoring, for STR test facility, 11: 12516
4π-crystal-scintillation counting, dead-time and coincidence corrections, 11: 1587(J)
4π-crystal-scintillation counting, technique and results, 11: 1586(J)
laundry monitor for α contamination, 11: 2988(J)
millimicrosecond coincidence instrumentation and limitations, 11: 1982
modified for reduction of counting time in low activity assays, 11: 1583(J)
operating principles, types, and development of scintillation counters, 11: 10655(J)
operation at high temperatures and addition of NH_3 to detector, 11: 6591(P)
performance, having immersion counter for use with solutions, 11: 4566
performance and calibration for localization of radioisotopes in the human body, 11: 514(J)
performance effects of pulse pile-up, 11: 1582
performance for in vivo measurements of very low levels of radiation in human subjects, 11: 4251(J), 4584(J)
performance in determinations of radioactivity of human body, 11: 9001(J)
performance of, in x-ray analysis, 11: 1601(J)
performance of liquid scintillation counter with two channel pulse height analyzer for counting double-labeled compounds of C^{14} and tritium, 11: 13229(R)
performance of small-volume internal-sample liquid, 11: 13389
photomultiplier thermal-noise reduction, 11: 507(J)
proportional response of large area scintillation counter for cosmic rays, 11: 5446(J)
quantum counting rate converted to roentgens from, 11: 1599(J)
reactor irradiation of standard fission counter, 11: 489
response of liquid scintillation counter to extensive air showers of low density, 11: 12154(J)
scintillation spectrometer for studying α, β, and γ rays in coincidence, 11: 6831(J)
scintillation type, temperature dependence of photomultiplier gain in, 11: 5970(J)
screen-wall and anticoincidence, for C^{14} dating, 11: 771(J)
sensitivity of fast neutron dosimeters using Hornyak buttons, 11: 1618(R)
simultaneous control system for assemblies of two to eight scalers, 11: 2600
spectrometer with constant relative channel width, 11: 8094(J)
time-of-flight, for measurement of fast neutrons, 11: 12150(J)
time response improvement in scintillation counting, 11: 4585(J)
utilizing proportional detector, performance in radiometric determination of fission products, 11: 7263

Radiation detectors
(See also specific detectors, e.g., Cloud chambers; Crystal detectors.)
Argon Gammagraph, battery operated for background and emergency γ radiation, design, 11: 2603
for background radiation, design, 11: 493(J)
biological indicators, lymphocytes with bilobed nuclei as, 11: 56(J)
chemical, calibration for use as dosimeters, 11: 2989(J)
design, 11: 3976, 10652(J)
design of fast, for heavy particles, 11: 3974(J)
for fast neutrons, performance, 11: 14034
ionizing, neon flash tubes as, 11: 10190(J)
for low-level measurements, 11: 56(J)
low range chemical dosimeter, 11: 1985(J)
performance of gridded air chamber and methane proportional counter for estimating Pu by α counting, 11: 4564
placement for maximum safety control of reactors, 11: 666(J)
for radiobiological studies, survey, 11: 10194(J)
response of chemical, film, and fission foil dosimeters to γ radiation and to neutrons, 11: 1725(R)
survey of, 11: 2775(J)

Radiation effects
applications in processing commercial products, bibliography, 11: 3873
bibliographies, 11: 6959, 11470, 11471
bibliographies, on plastics, polymers, adhesives, and polymerization, 11: 8857
bibliography of, on electrical and electronic components, 11: 12289
bibliography of, on solids, 11: 1370, 5667
biological, summary of laws concerning, 11: 5166(J)
calculation and measurement in solids, 11: 11467
on cancer patients exposed to doses of 15 to 200 r whole-body x irradiation, 11: 12655
on cerium salts in dilute aqueous solutions, 11: 7133(J)
of charged particles on mechanical properties of solid bodies, 11: 6565(J)
on covalently bonded chemical compounds, 11: 13630
on critical organs, 11: 56(J)
on crossing over in Drosophila, 11: 8773(J)
in crystalline solids, review, 11: 5067(J)
determination of gamma, on linear polyethylene by infrared analysis, 11: 6675
displacement of atoms by heavy particle irradiation, 11: 6962(J)
displacement of atoms in solids and the recovery process, 11: 7366(J)
on elastomeric compounds and compounding materials, 11: 7360
on electronic components, 11: 8215
on electronic properties of solids, 11: 7362(J)
equipment and techniques for irradiating U in liquid Na, 11: 9607
experimental facilities for measuring, in the MTR, 11: 7819
gamma and β, on CdS photoresistance, 11: 1746(J)
on graphite, Hall constant change with neutron bombardment, 11: 8309
in industry and research, Soviet Union Conference on Applications of Isotopes, Moscow, Apr. 4-13, 1957, 11: 12126(J)
on insulating plastics, 11: 171(J)
in ionic solids, 11: 763(J)
low-temperature reactor, in metals, 11: 9158(J)
on lubricating oils, 11: 964
on marine animals and land plants due to fall-out, radiobiological survey, 11: 9192
on materials, bibliography, 11: 169, 170
on materials, design of testing facility using high-intensity γ source, 11: 10588
on materials, handbook, 11: 10781
on mechanical properties of Zr and Ti, 11: 761
mechanism of, on materials, 11: 4161
mechanism of annealing in neutron-irradiated metals, 11: 13548(J)
on metal crystals by low-temperature high-energy electron bombardment, 11: 1692(J)
on metals, alloys, insulators, and chemical systems, 11: 7850(R)

Radiation effects (cont'd)

on metals, physical metallurgical processes, and reactor materials, 11: 4898(J)

on metals and organic compounds, 11: 8858(J)

on methanol, ethanol, and acetone, 11: 1805

on organic compounds, compilation of data on, 11: 3558

on permeability of polyethylene to chemicals and reagents, 11: 1413(R), 1414(R)

on physical properties of solids, 11: 2186(J)

on plastics, coatings, and gasket materials used in radiochemical plants, 11: 1374

on plastics and polymers, 11: 3358(J)

on polyethylene melting behavior, 11: 4351(J)

on polymers, post-irradiation oxidation, 11: 965(J)

on polymers and elastomers, 11: 1804

on polymethyl methacrylate and styrene polymers, 11: 4350(J)

on pumps, 11: 6958

on reactor materials, solids, and liquids, 11: 168(J)

on reactor materials, survey, 11: 7887

review of theory and experiments, 11: 5668(J)

separation in mixed radiation field, experimental design for, 11: 9157

on stability of uranium–zirconium fuel alloys, 11: 7884

target theory, mathematical analysis of experimental results, 11: 4243(J)

thermal spike picture of damage in metals, 11: 13210

vulcanization, 11: 767(J)

x-ray-diffraction analysis of, in ionic, covalent, and metallic crystals, 11: 5066

on Young's modulus and internal friction of Cu, 11: 2187(J)

Radiation effects conferences

first semi-annual symposium, Fort Worth, Texas, May, 1957, 11: 11469

Radiation exposure chambers

design, for neutron irradiation of biological materials, 11: 3950

for irradiation under pressure or where a gas is evolved, 11: 6273

Radiation injuries

(See also Radiation damage; Radiation sickness.)

of adult brain resulting from exposure in utero, 11: 1742(J)

aftereffects in Hiroshima and Nagasaki victims, 11: 9206(J)

age dependence in response to, in adult female mouse, 11: 9942(J)

of bacteriophages, protective effects of cysteine, 11: 4252(J)

of blood and organs following exposure at various dosages, 11: 7056(J)

of blood cells of mice, 11: 5737

of blood vessels in dogs, 11: 5730(J)

of bone marrow, pathology, 11: 11029(J)

of bone marrow, protective effects of cysteine, 11: 5168(J)

of bone marrow, protective effects of treatment with rutin and vitamin P, 11: 5744(J)

of bone marrow following intravenous injection of Au^{198} in rats, 11: 3290(J)

central nervous system response, effects of various drugs in mice, 11: 5167(J)

characteristics of skin response, 11: 3660(J)

chemical prophylaxis, 11: 12960(R), 13565(R), 13566(R)

chemical prophylaxis, screening tests on 50 agents, 11: 11841(R)

chemical prophylaxis in mice, 11: 4781(R)

Radiation injuries (cont'd)

chemical prophylaxis with cysteamine and cystamine, 11: 879(J), 1756(J), 4797(J), 5176(J), 7071(J), 8806, 8796(J)

chemical prophylaxis with cysteamine or cystamine in mice, 11: 4253(J)

in children exposed while in utero to the Hiroshima atomic bomb, 11: 36(J)

of chromosomes, effects of cation imbalance, 11: 13238(J)

coagulation defect associated with, therapeutic effects of serotonin, 11: 2776

delayed chemical and biological effects on animals and humans, 11: 5722(J)

delayed effects on man, 11: 9938(J)

diagnosis, 11: 12655

dietary factors in absorption processes of small intestines of dogs, 11: 1397

due to fall-out, a survey of Marshallese two years after exposure, 11: 832

due to fall-out from thermonuclear explosion, diagnosis and therapy, 11: 834

effects of age and growth on LD_{50} of mice, 11: 874(J)

effects of anoxia tolerance, 11: 9193(J)

effects of antithyroid drugs, intravenous feeding, and flavonoid compounds in rats, 11: 12959(R)

effects of body position during whole-body exposure of rats, 11: 10407(J)

effects of injected intestinal extract and of bulbocapnine hydrochloride on, in mice, 11: 1725(R)

effects of latent period and dosage levels, 11: 39(J)

effects of liver and kidney catalase levels on, in rats, 11: 54(J)

effects of tissue sulfhydryl concentration on, in mice, 11: 2799(J)

effects on immunity of animals, 11: 2782(J)

effects on immunity to infections, 11: 1724

effects on pregnant rats and fetus, 11: 10403(J)

effects on susceptibility to oral infections in mice, 11: 47

evaluation by determination of plasma Fe^{59} clearance rate, 11: 6600(J)

from fission reactions, 11: 3301(J), 11560

following injection of Au^{198} in rats, 11: 7062(J)

of gastrointestinal tract induced by uptake of Ru^{106}, Ce^{144}, Sr^{89}, and Sr^{90} in rats, 11: 9930(J)

genetic, calculated for employees of UKAEA, 11: 4787(J)

genetic factors affecting, in mice, 11: 5728(J), 13236(J)

of gonads in rats, 11: 12645, 12646

to gonads of female mice, effects of gonadotrophic hormone treatment, 11: 8772(J)

hematological factors, 11: 3291(J)

of hematopoietic tissue, influence on survival of rats, 11: 5153(J)

to hereditary factor of man, 11: 11860(J)

induced by chronic induction of Ce^{144} into gastrointestinal tract of rats, 11: 3283(J)

influence of blast injuries on, in mice, 11: 5131(J)

influence on transplantation of blood-forming tissue, 11: 885(J)

of lactating mothers, effects on suckling young mice, 11: 2787(J)

of large animals, relationship of dosage to life span, 11: 6607(J)

of living tissues induced by cosmic radiation, 11: 4782

mathematical correlation with organ weight changes, 11: 2790

mechanisms, prophylaxis, and therapy, 11: 44(J)

modifications by chemical and biological preparations, 11: 7823(J)

modifications induced by dextran in rats, 11: 6215(J)

Radiation injuries (cont'd)
modifications induced by spleen shielding or chemical treatment in mice, 11: 8799(J)
of mouse thymus, regeneration following, 11: 5156(J)
of nerves of salamander larvae, 11: 5169(J)
of nervous system and related tissues, histopathological study, 11: 6198(J)
neurological effects, 11: 3648
pathological effects of radiation on introceptive unconditioned reflexes in animal organisms, 11: 9926(J)
pathology, 11: 12642(R)
of peripheral blood, protective effects of treatment with cysteine, rutin, and homologous bone marrow, 11: 5745(J)
physical and biological factors, 11: 6620(J)
of physicians engaged in radiography, 11: 846(J)
prophylactic and therapeutic effects of various chemical compounds and tissues, 11: 2779(R)
prophylactic effects of β-mercaptoethylamine, becaptan disulfide, and injections of splenic plasma on, in mice, 11: 3479(R)
prophylactic effects of bone marrow inoculation, genetic factors in mice, 11: 10413(J)
prophylactic effects of cysteamine on, in rats, 11: 3309(J)
prophylactic effects of injected blood serum and tissue homogenates, 11: 830(R)
prophylactic effects of isomers of phenergan, negative effects in mice, 11: 7910(R)
prophylactic effects of quinoxaline 1:4 di-n-oxide in mice, 11: 9576(R)
prophylactic effects of sodium salicylate in mice, 11: 7695(R)
prophylactic effects of sulfhydryl compounds injected in mice, 11: 6208
prophylaxis, effectiveness of various chemicals, 11: 9915(R)
prophylaxis and therapy using various compounds, 11: 4224, 4226(R)
prophylaxis in rabbits, 11: 11022(R)
prophylaxis with histamine, negative results, 11: 9965(J)
protection, maximum permissible exposure problems and regulations, 11, 56(J)
protection afforded by glutathione, 11: 8797(J)
protection afforded by injected embryonic cell material in mice, 11: 8798(J)
protection and recovery, genetic implications, 11: 15(J)
protective adaptation reactions against, 11: 9927(J)
protective effects and pharmacology of β-aminoethylisothiuronium, 11: 5746(J)
protective effects of ACTH against, in rats, 11: 7072(J)
protective effects of AET in monkeys, 11: 7076(J)
protective effects of albumen solutions of casein, parathyrin, saccharose, and colloidal-salt solution transfusion against hemolysis in irradiated rabbits, 11: 7073(J)
protective effects of gonadectomy and cysteamine treatment against, in mice, 11: 5742(J)
protective effects of implanted spleens in mice, negative results, 11: 9961(J)
protective effects of injected bone marrow against, 11: 8776(J), 8795(J), 9952(J)
protective effects of liver and spleen autolysates, spleen homogenates, and spleen implantation against, in rats and mice, 11: 5743(J)
protective effects of mercaptoethylamine against, in mice, 11: 4254(J)
protective effects of pre-irradiation, 11: 9944(J)
protective effects of reticulo-endothelial system stimulation against, in rabbits, 11: 1725(R)
protective effects of sodium diphenylhydantoin in mice, 11: 7919
protective effects of spleen tissue preparations against, in mice, 11: 5740(J)
protective effects of 3-amino-1, 2, 4-triazole against, in mice, 11: 6619(J)
reactions in blood and organs of animals, 11: 7056(J)
regenerating effects of ligature in, of tissues, 11: 3314(J)
relationship of dose to damage in mice, 11: 27(J)
remote effects from, 11: 10404(J)
resulting from x-ray diagnostic procedures, 11: 880(J)
reticulosis following chronic exposure, 11: 8770(J)
role of bacterial infection, 11: 18
sensitivity of irradiated animals to gas gangrene and tetanus and effectiveness of sulfur prophylactics during, 11: 7913(J)
shortening of life span by chronic exposure, 11: 12647(J)
shortening of life-span in the offspring of male mice exposed to neutron irradiation, 11: 6205
similarity to accelerated biological aging processes, 11: 8765
of skin resulting from roentgenotherapy, effectiveness of azulon preparations in prophylaxis and therapy, 11: 3308(J)
syndrome in rats, 11: 11857(J)
theory, 11: 8764, 12644
therapeutic effects of bone marrow treatment in mice, 11: 7074(J), 11880(J)
therapeutic effects of injected spleen homogenates in mice, 11: 6617(J)
therapeutic effects of methionine treatment in rats, 11: 11882(J)
therapeutic effects of quinoxaline oxide in mice, 11: 7695(R)
therapeutic index of antibiotics, 11: 6214(J)
therapeutic method for reducing local response to, 11: 3663(J)
therapy, effectiveness of cortisone treatment, 11: 10406(J)
therapy, effectiveness of various chemicals, 11: 8259(R), 9915(R)
therapy, screening tests on 50 chemical agents, 11: 11841(R)
therapy with injected bone marrow tissue culture cells in mice, 11: 5739(J)
therapy with injected embryo extracts and anti-shock compound, negative results, 11: 2233(R)
therapy with leukocytes of leukemoid blood, in mice, 11: 11878(J)
of thyroid gland following I^{131} administration to dogs, 11: 11845(J)
of thyroid gland following I^{131} injection in rats, 11: 6197

Radiation monitoring
(See also Aerial Surveying.)
data and definitions used in radiation dosimetry, survey, 11: 48
design of continuous device for low-activity water streams, 11: 1240
equipment design, 11: 4544(R)
of high-energy electron beams using Faraday cups, 11: 1598(J)
at Savannah River Laboratory, 11: 4326
scintillation detector for, 11: 2985(J)
of surface streams, 11: 1498
Tracerlab service outline for reactors, 11: 7267(J)

Radiation phantoms
See Phantoms.

Radiation protection
(See also Health physics; Radiation detection instruments; Remote-control equipment; Shielding.)
against health hazards from reactor fission products, 11: 11558

Radiation protection (cont'd)

bibliographies, 11: 7067

data and definitions used in radiation dosimetry, survey, 11: 48

decontamination of cotton clothes, 11: 3303(J)

during waste disposal, 11: 903(J)

during x ray diagnostic procedures, 11: 880(J)

in handling radioactive isotopes, 11: 3302(J)

international recommendations, criticism, 11: 8802(J)

manual, 11: 9966(J), 10411

material combination for gamma, x-ray and neutron, 11: 1712(P)

maximum permissible dosage, 11: 56(J)

of military personnel, 11: 7924(J)

papers from conference on, 11: 3310(J)

in peacetime use of nuclear energy, 11: 9955(J)

of personnel, shelter evaluation, 11: 7922

of personnel in vacuum deposition plants, 11: 9958(J)

personnel monitoring, design of a scintillation detector for, 11: 2599

problems and legislature, 11: 56(J)

public health aspects, 11: 5174(J)

rules for, book, 11: 11889(J)

screening of compounds for, sampling methods, 11: 11885(J)

in separations plant, 11: 3296

within standard housing structure against fall-out gammas, 11: 9203

survey, 11: 9959(J)

Radiation-scattering analysis

(See also Neutron-diffraction analysis; Proton-scattering analysis; X-ray-diffraction analysis.)

theory and applications, 11: 107

Radiation shielding

(See Shielding.)

Radiation sickness

(See also Radiation injuries.)

adenylpyrophosphatase activity in acute and subacute, 11: 3671(J)

alterations in methionine absorption from gastrointestinal tract during, 11: 2800(J)

biochemical changes in liver, 11: 3670

blood forming stimulants in leukopenia, 11: 3313(J)

blood platelets changes during, in rabbits, 11: 888(J)

creatine and creatinine content in urine of rats during, 11: 3285(J)

cysteinamine efficacy in prophylaxis of, 11: 10417(J)

determination of death causes and processes in acute, of rabbits, 11: 7058(J)

effectiveness of pyridoxin hydrochloride, chloropromazine hydrochloride, cyclizine hydrochloride, and Pacatal hydrochloride for relief of symptoms, 11: 5177(J)

effects on antigenic properties of tissues, 11: 6621(J)

emesis induced by, effect of localized brain stem lesions and supradiaphragmatic vagotomy in monkeys, 11: 4232(J)

following atomic explosion, 11: 6593(J)

hemorrhage syndrome in, 11: 854(J)

induced by rays from 10-Mev betatron, 11: 887(J)

liver metabolism during, 11: 3658(J), 3659(J)

mercapto group chemicals in prophylaxis, 11: 882(J)

Radiation sickness (cont'd)

pathophysiological reactions in animals during acute, 11: 7077(J)

prophylactic action of adrenaline in conjunction with acetylcholine in, of mice, 11: 9968(J)

prophylactic effects of antibotics against B. tetani and B. perfringens infections associated with, 11: 886(J)

role of infections, 11: 9967(J)

stimulation of haemopoiesis in therapy of, 11: 9969(J)

syndrome in mice, rats, and monkeys, 11: 2789(J)

therapeutic effects of transfusions of leukocytes, 11: 2801(J)

therapeutic uses of tannic acid in, 11: 889(J)

vagosympathetic novocaine blockage as therapeutic measure in dogs, 11: 3312(J)

Radiation sources

(See also Radioapplicators and sources of specific radiation, e.g., Alpha sources.)

availability and economics, 11: 2775(J)

available from the French Commissariat a L'Energie Atomique, 11: 5954(J)

biological effectiveness of 4 Mev linear accelerator and deep therapy x radiation, 11: 9920(J)

calculation of emission and absorption, 11: 5662(J)

for calibration of detectors, 11: 1585(J)

calibration of radium, 11: 5440

characteristics of circular and semi-circular, 11: 6419

for clinical uses, design, 11: 63(J)

costs of commercial electron accelerators and fission products, 11: 12756

design and construction of a 2,000 curie Co^{60}, 11: 6153(J)

design of megacurie Co^{60}, 11: 1377

development of, from waste fission products, 11: 8280(R)

electron linear accelerator as pulsed, 11: 6943(J)

fission products as, 11: 8862(J)

flux distribution from geometric, equations, 11: 2753

gamma and x ray, design for food sterilization, 11: 11023(R)

high activity Co^{60} as, 11: 10625(J)

high level, use, industrial health and safety, and radiological health codes, 11: 56(J)

homogeneous cylinders and spheres, mathematical analysis of flux as function of distance, 11: 2760

industrial applications, 11: 210(J)

initial intensities of, methods of measurement, 11: 2193(J)

intensity measurement, method for improving precision of inverse square, 11: 12133

large-area uniform, aerosol generator for producing, 11: 10151(J)

natural, bibliography, 11: 50

preparation from reactor waste, 11: 13043(R)

preparation of, from mixed fission products, 11: 13580(R)

preparation of Fe^{55} disks, 11: 3933

preparation of thin Pu^{239} sources by adsorption on glass, Al, and Pt surfaces, 11: 10113(J)

safety in using, manual, 11: 9966(J)

self absorption, 11: 6134(J)

standardization, 11: 784(J)

survey, 11: 5420

well-type calibration installation, 11: 2601

Radiation target cans
(See also Slug cans.)
design for high-flux irradiations of fuel materials, 11: 13723
heat transfer in MTR, 11: 2697
Radiation targets
(See also Materials Testing Accelerator targets.)
mercury vapor jet as, 11: 4906(J)
neutron emission from, 11: 13114(R)
preparation of Al, Ag, Au, Li, Na, UCl_4, ThF_4, Be, SiO, NaI(Tl), U, and UO_2 films for, 11: 3007
thermal stress calculations for U (Zr clad), 11: 7879
thermal stresses in, subjected to rapid heating, 11: 7867
thin Mylar gas holders, construction, 11: 8979(J)
Radiation targets (Ir)
preparation, 11: 10560(R)
Radiation targets (Th)
bombarded with 190-Mev deuterons and 340-Mev protons, 11: 8722
heat loads from neutron bombardment, 11: 10995
transient temperatures and thermal stress in, 11: 9757
Radiation targets (U)
bombarded with 190-Mev deuterons and 340-Mev protons, 11: 8722
neutron production in, when bombarded by high-energy protons and deuterons, 11: 8729
Radio well logging
See Well logging.
Radioactivation analysis
See Radiometric analysis.
Radioactive contamination
(See also Decontamination; Stack disposal; Waste disposal.)
detector for, 11: 3976, 10652(J)
equipment for use in control and decontamination, 11: 13571(R)
from fall-out containing Cs^{137}, 11: 9943(J)
of foodstuffs due to fall-out, effects on results in animal tracer experiments, 11: 7084(J)
laundry monitor for α, 11: 2988(J)
of Marshall Islands from thermonuclear tests, March, 1954, 11: 12638(J)
maximum permissible limits in air, 11: 11036
measurement, transistor circuit design for, 11: 6814
monitoring, in air, 11: 11036
from particulate contamination from stacks, methods for prediction, 11: 5734(J)
of PWR primary system, 11: 10737(R)
of skin, decontamination by iontophoresis, 11: 2797(J)
in vegetation, soils, bones, and milk from Sr^{90} fall-out, 11: 9201
Radioactive elements
See Radioisotopes.
Radioactive isotopes
See Radioisotopes.
Radioactive materials
application to removal of electrostatic particles, 11: 10116(J)
biological effects and toxicology studies, review, 11: 5723(J)
decontamination of aqueous solutions by precipitation, 11: 3227(P)
demolition of α-contaminated building, 11: 1026
design of laboratories for handling, 11: 6275
dosage distribution in environments of, 11: 2189(J)
Radioactive materials (cont'd)
on filter paper, total absolute activity estimation, 11: 4294(J)
handling, metallographic methods for, 11: 362(J)
melting and pouring, design of equipment for, 11: 13334
metallography, 11: 2223, 9322
metallography of irradiated U, 11: 8503
particle sorting by degree of radioactivity, 11: 5100(P)
preparation of thin films of, 11: 4962(J)
separation and removal from H_2O by coagulation, 11: 8141
spectrographic analysis by the Cu spark method, 11: 2841(J)
storage, inexpensive shield for, 11: 1702(J)
synthetic, fall-out from the atmosphere, 11: 785(J)
Radioactive minerals
(See also specific radioactive minerals.)
absolute age determination, 11: 4868(J)
aggregation of microquantities of, in liquid and solid phases, 11: 9519(J)
autoradiographic analysis for U, 11: 944(J)
design of ionization chambers for the study of, 11: 1248(J)
determination of natural, by quantitative radiochemical methods, 11: 13551(J)
diffusion of daughter products from, 11: 4868(J)
exploration for, in Munich, 11: 12735(J)
particle sorting by degree of radioactivity, 11: 5100(P)
prospecting and detection for, methods, 11: 298(J)
prospecting for, in Alaska and northwestern, western, and southeastern U.S., 11: 3825
prospecting for, problems, 11: 293(J)
rock-drilling apparatus for prospecting, 11: 1713(P)
simultaneous determination of U, Ra, Th, and Ac in, 11: 2839(J)
Radioactive minerals (Idaho)
exploration of Bear Valley District for, 11: 3821
occurrence in Camp Creek Placer Area, 11: 3824
Radioactive ores
See Radioactive minerals.
Radioactivity
(See also Decay curves; Decay schemes; Induced radioactivity.)
calorimeter design for easily absorbed, 11: 8282(R)
identification and measurement of impurities, 11: 1993(J)
intensity of γ from rough ground, 11: 1378
investigations of decay chains, 11: 774(J)
measuring instruments, automatic equipment for, 11: 3472(J)
methods and procedures for calculating, 11: 2758
in rocks, autoradiographic determination, 11: 5455(J)
of rocks, use of liquid emulsions in study of, 11: 2907(J)
standards, preparation, and absolute methods for determination, 11: 6571
technical applications of, book, 11: 12296(J)
time-correlated decay, generalization of Marsden-Barratt Law for, 11: 9164(J)
tissue deposition of, from atomic explosions, 11: 12315
use in age determination of the earth, 11: 6360(J)
Radioapplicators
(See also Radiation sources.)
calibration of Sr^{90}, 11: 3479(R)

Radioapplicators (cont'd)
design for implantation of Au^{198} seed, 11: 8811(J)
design of Co^{60}, for therapeutic use, 11: 6625(J)
design of Sr^{90}, 11: 4258(J)
permanent implantation in tumors, 11: 4259(J)
preparation of Co^{60} for treatment of lip cancer, 11: 6623(J)

Radioautography
(See also Nuclear emulsions; Photographic film detectors; Radiography.)
alpha-tract, applications in biological and medical studies, 11: 56(J)
distribution and diffusion of components in alloys, 11: 210(J)
following neutron activation, 11: 1410
measurements of low concentrations of α radiators in plants by, 11: 7086(J)
metallurgical applications of high-resolution, 11: 4882
mounting of stained stripping film autoradiographs, 11: 3972(J)
preparation of thick bone samples for study of short-range β emitters, 11: 7291(R)
quantitative, using a radioactive wedge, 11: 1409
of serial cross-sections of undecalcified bone, 11: 1411
stripping-film technique, 11: 1408
uranium localization in lamellae of alloys in nuclear emulsions using, 11: 2229(J)

Radiobiology
in agricultural research, 11: 4804
cellular, review of 1955 literature on, 11: 5144(J)
conference held at Cambridge, England, August 14 to 17, 1955, 11: 45(J)
counting techniques, 11: 10194(J)
methodology and theory, book, 11: 11910(J)
radiation effects on aqueous solutions, review, 11: 9945(J)
radioinduced effects in genetics and mutations, 11: 10405(J)
review of progress in 1956, 11: 5500(J)
theory of delayed radiation effects, 11: 10029(J)
in the U.S.S.R., conference, 11: 11016(J)
vertebrate embryology, review, 11: 5145(J)

Radiochemical processing plants
Analytical Control Laboratory operation manual for ICPP, 11: 8856
biological shielding design factors, 11: 12314
component and mock-up studies, loop design modifications for HRT, 11: 8640
condenser design for HRT, 11: 10933
control limits, effect of product variability, 11: 2267
criticality between process vessels in, 11: 1177
criticality hazards, 11: 8677(R)
criticality studies of final cycling of enriched U, 11: 13291
design, for spent fuel elements, 11: 11983(J)
design and cost estimate for U and Pu fuel elements, 11: 5817
design considerations, 11: 3737(J)
design for direct maintenance, 11: 13517(J)
design for KAPL Fast Oxide Breeder Reactor, 11: 13005
design of solids feed loop for shakedown of HRT, 11: 8639
design of UO_3 Plant for control of airborne contamination, 11: 7068
direct maintenance, practicality, 11: 194(J)
dissolver operation in HRT, 11: 9621

Radiochemical processing plants (cont'd)
economics for power reactor, 11: 8874(J)
equipment for removal of fission gases, 11: 11975
equipment-maintenance manuals, 11: 2297
equipment operation experience, effect on Purex plant design, 11: 7965
evaluation of hypalon rubber as construction material, 11: 12016
evaluation of $1F^4$ fluororubber as construction material, 11: 12017
flow of reactor solution to processing cells, precautions, 11: 4085
health and safety activities, 11: 56(J)
instrument interlocks for HRT, 11: 10930
instrumentation for Detroit Edison Aqueous Recovery Plant, 11: 7135
leak detection system in HRT, 11: 2296
maintenance experience, 11: 7965
nuclear safety considerations in design of, 11: 9953(J)
performance of air-lift pumps for use in, 11: 7170
personnel radiation exposures in Thorex plant, 11: 13568
pipe line designation table for HRT, 11: 9824
preconcentration of high activity acid waste, cost factors, 11: 3778
process wastes, precipitation and solid removal from, 11: 190(J)
recombiner design for HRT, 11: 10934
remote and direct maintenance, features, advantages and disadvantages, 11: 3735
for reprocessing nuclear fuels, economic aspects, 11: 8875(J)
safety recommendations for air contamination by NO_2, HNO_3, and UO_3 at Hanford 224 U building, 11: 7046
statistical analysis applied to operating variables, 11: 1232
superheater design for HRT, 11: 13622
waste disposal, 11: 9283

Radiochemistry
analytical procedures development, 11: 12330(R)
analytical techniques, 11: 12330(R)
application of micro-chemical methods to radiochemical analysis, 11: 5210
conference in Soviet Union March 5-9, 1957, 11: 11954(J)
co-precipitation mechanisms of radioelements with precipitations of slightly soluble salts, 11: 98(J)
equipment and techniques, 11: 1798(J)
generalized acidity in, 11: 5196(J)
identification methods for hazardous nuclides, 11: 11952(J)
radiation effects on aqueous solutions, review, 11: 9945(J)
reproducibility of radioactive sample preparation, 11: 4333(J)
research in the Netherlands, 11: 11070
review of progress in 1956, 11: 5500(J)
survey, 11: 5420
tracers in research, use of, 11: 11993(J)

Radiocolloids
See Colloids.

Radiodiagnosis
applications of Fe^{59}, 11: 902(J)
applications of radioisotopes, 11: 4219(J), 6626(J)
book, 11: 11901(J)
of brain tumors, equipment, 11: 4591(J)
importance of facilities in general hospitals, 11: 8809(J)

Radiodiagnosis (cont'd)
of intraocular tumors, applications of P^{32}, 11: 2809(J), 7928(J), 8817(J)
of iron metabolism disturbances, tracer method, 11: 6630(J)
of malignant tumors, 11: 7081(J)
permissible dosage determinations, 11: 3300(J)
review, 11: 11905(J)
of spinal cord lesions by radioisotope myelography, 11: 7083(J)

Radiofrequency generators
(See also Pulse generators (electronics).)
modulation system, design for, 11: 9560(P)
tunable for FFAG accelerators, electrical properties, 11: 3586

Radiofrequency oscillators
for Argonne synchrotron, 11: 8199(R)

Radiographic inspection
See Radiography.

Radiography
(See also Neutron photography; Photographic film detectors; Radioautography.)
applications by veterinarians, radiation hazards, 11: 1754(J)
applications of radioisotopes as radiation source, 11: 7078(J)
applications of Tm^{170} for γ-ray, 11: 890(J)
of casting and weld defects, 11: 1062
clinical, radiation hazards for children, 11: 2798(J)
combined with histology for study of structures with microscopic dimensions, procedures and errors, 11: 57(J)
dental, radiation dosage determinations, 11: 9962(J)
dental diagnostic, effects on blood picture, 11: 5135
equipment for radiographic analysis of U alloys, 11: 2772
gamma, application for inspection of aircraft components without disassembly, 11: 10521(R)
gamma, by projection from radioisotopes, 11: 7172(J)
neutron techniques, 11: 256(J)
pathological effects of ionizing radiations to humans, 11: 32(J)
permissible radiation dosage determinations, 11: 3300(J)
radiation dose to patients and personnel, 11: 3298(J), 3299(J)
radiation hazards during, 11: 880(J)
radiation hazards to physicians engaged in, 11: 846(J)
slide rule for, 11: 3929(J)
of steel, gamma sources for, 11: 4449
synthetic isotope application in, 11: 10522(J)
techniques for fuel element inspection, 11: 12057

Radioisotope applicators
See Radioapplicators.

Radioisotopes
(See also Fission products; Tracer techniques.)
absorption coefficient of β-energy of, 11: 2189(J)
agricultural applications conference, 11: 4804
agricultural program in Europe in 1956, 11: 11903
applications in agricultural research, 11: 5(J), 5750(J)
applications in biological and medical research, 11: 6629(J)
applications in Britain, 11: 3474(J)

Radioisotopes (cont'd)
applications in cancer research and therapy, 11: 7081(J)
applications in diagnosis and therapy, importance in general hospitals, 11: 8809(J)
applications in research and industry, 11: 210(J), 5420
applications in the national economy and science in the U.S.S.R., 11: 11016(J)
available from the French Commissariat a L'Energie Atomique, 11: 5954(J)
carcinogenicity, 11: 1392
clinical applications in tracer studies on metabolism, 11: 2812(J)
clinical use, 11: 6626(J)
clinical uses, book, 11: 11901(J)
commercial applications, economic aspects, 11: 10028(J)
decay modes of natural, 11: 12934(J)
diffusion and atomic interaction in alloys, investigations, 11: 210(J)
distribution, control and protection, problems, 11: 56(J)
effect of I^{131}, Sr^{89} and Sr^{90} in food chains, 11: 56(J)
enrichment by thermal diffusion, 11: 3940
gamma spectrometric analysis, 11: 1438
half life measurements by differential chamber method, 11: 12141(J)
half lives, 11: 10156(J)
half lives, graphical method for determination, 11: 12295(J)
handling, shipping, and storage, 11: 520(J)
handling safety, manual, 11: 9966(J)
identification methods for hazardous, radiochemical, 11: 11952(J)
industrial applications in studies of flow patterns, 11: 3802(J)
industrial uses, 11: 474(J), 2775(J)
instrumentation, 11: 4576(J)
localization in the human body, procedures and instruments for detection, 11: 63(J), 514(J)
maximum permissible concentration, 11: 12653(J)
maximum permissible concentrations in air and water for short exposures, 11: 56(J)
maximum permissible intake vs. detection instrument sensitivity, 11: 10422(J)
maximum permissible internal dose, 11: 3306(J)
measurements of low concentrations of alpha-emitters in plants by thick radioautograms, 11: 7086(J)
medical and industrial applications, 11: 520(J), 4219(J)
medical applications in research, diagnosis, and therapy, 11: 11905(J)
medical applications in therapy and tracer studies, 11: 63(J)
in medical radiography, 11: 7078(J)
methods of measurement for commonly used, 11: 1585(J)
nuclear properties, activation handbook, 11: 11360
orbital electron capture, standardization by proportional counting, 11: 4169(J)
permissible limits, computational techniques and basic concepts for long-lived, 11: 2233(R)
poisoning by, treatment, 11: 56(J)
preparation, application of nuclear recoil to, 11: 6794(J)
preparation and isolation of high specific activity and carrier-free, 11: 470(J)
preparation and separation from fission product solutions, 11: 3367(J)

Radioisotopes (cont'd)
production, 11: 520(J)
production, present and prospective applications in the South, 11: 6(J)
production at ORNL, 11: 9987(R)
production using charged particles, 11: 12798
properties and production, review, 11: 473(J)
protective measures for safe handling, 11: 3302(J)
radiation dosage determinations for some commonly used, 11: 2796
radiographic uses of synthetic, 11: 10522(J)
removal from blood by artificial kidneys and ion-exchange resins, 11: 4255(J)
removal from PWR coolant by ion exchange, 11: 5264
removal from water by organic complexing and adsorption of activated charcoal, 11: 8318
sorption on ceramic bodies, 11: 8432
standardization, source-mount preparation, 11: 2027(R)
standards, preparation, and calibration, 11: 6571
therapeutic and diagnostic applications, 11: 6221(J)
therapeutic uses, 11: 10421(J)
therapeutic uses, physical considerations, 11: 6219(J)
tissue distribution, mathematical analysis, 11: 52(R)
tracer applications, instrumentation, 11: 1256(J)
tracer applications in biological studies, 11: 5753(J)
tracer techniques and application, 11: 15(J)
use in medical clinic in Ljubljana, 11: 11896(J)
uses in heterogeneous-catalytic-reaction studies, 11: 210(J)

Radiological defense
(See also Civilian defense; Radiological warfare.)
shelter system specifications, 11: 4218

Radiological monitoring
See Radiation monitoring.

Radiological telemetering systems
design and performance of wide band microwave link, 11: 12111

Radiological warfare
(See also Civilian defense; Radiological defense.)
bibliography on, 11: 11013
blast effects, radiation injuries, fall-out hazards, biological effects, 11: 9205(J)
monitoring of civilian population with photographic film and dental x-ray film, 11: 4588(J)
nuclear weapons effects, manual, 11: 9205(J)
radiation hazards and protection in, introductory information, 11: 8803(J)

Radiology
medical, review of accomplishments and problems, 11: 5721(J)
sanitation and protective measures against radiation hazards in peacetime, 11: 5738(J)

Radiolysis
See Radiation chemistry.

Radiometers
quartz fibers for high-sensitivity, 11: 460(J)

Radiometric analysis
automatic sample counter design, 11: 4935
bibliography, 11: 1579

Radiometric analysis (cont'd)
of biological materials, 11: 10194(J)
of biological materials, bibliographies, 11: 6656
of fall-out material, efficiency of scavenging devices for sample collection, 11: 12807
filtration in gravimetric assay in, millipore molecular discs for, 11: 6681
of fish containing Sr^{89} by external monitoring, 11: 1257(J)
a formula for calculating the counting rate of a detector immersed into extended gases and liquids, 11: 13391(J)
of gases, sample preparation, 11: 3701
limitation of neutron activation method, 11: 7112
of man, 11: 9001(J)
of normal human blood, 11: 1437
preparation of samples of tissue, soil, and water, 11: 52(R)
preparation of weak β-emitting samples for liquid scintillation counting, 11: 10647
principles of, review, 11: 11938(J)
radiation standard calibration, 11: 1585(J)
sample preparation, 11: 4333(J)
sample preparation of filter papers for determination of Pu, 11: 10443
of solid cylindrical samples, calculation of energy absorbed by sample, 11: 10025(J)
theory and interpretation of counting data, 11: 1579
of tritiated water, sample preparation, 11: 3952
for tritium content in biological liquids, sample preparation, 11: 3677(J), 4806(J)
of uranium for U^{235} content, a comparison of methods, 11: 10506(J)

Radiometric thickness gages
See Thickness gages.

Radiometric well logging
See Well logging.

Radiopasteurization
(See Radiosterilization.)

Radiosensitivity
age dependence in adult female mouse, 11: 9942(J)
altitudinal factors affecting, of rats, 11: 876
of animals to pathogenic anaerobs and effectiveness of sulfur prophylactics on anaerobic infections during injuries, 11: 7913(J)
of antibody formation in mice, 11: 5720(J)
of bacteria, effects of chemical pre- and post-treatments, 11: 5736(J)
of biological systems, influence of porphyrins, 11: 11898(J)
effects of oxygen tension in E. coli, 11: 883(J)
effects of surgical stress, anesthesia, and spleen transplantation in mice, 11: 5161(J)
effects of work on, 11: 13243(J)
of embryos in mice, 11: 7917(J)
influence of oxygen level, 11: 11890(J)
influence of previous irradiation in mice, 11: 3276(J)
of malignant tumors, 11: 7080(J)
of mouse hair follicles, 11: 3278
of tumor cells from human tissue cultured in cheek pouch of hamsters, 11: 6196
of tumors in mice, relation to tumor size, 11: 6220
of wheat chromosomes, effects of ploidy, 11: 5154(J)

Radiosterilization
of beef and pork, effects of conventional processing on flavor, 11: 3651
economic aspects of commercial electron accelerators and fission products as radiation sources, 11: 12756
effectiveness on sliced apples, 11: 13233
of food, applications of radioisotopes, 11: 5420
of food, conference, 11: 4804
of food, radiation sources, facilities, and economics of, 11: 11023(R)
of food, survey, 11: 837(J), 4235(J), 11863(J)
of foods, effects on color and flavor, 11: 829, 12643
of foods, effects on wholesomeness, 11: 1396(J)
influence of radiosensitivity of bacteria on, 11: 7054(J)
of meat, effectiveness in delaying spoilage during refrigeration, 11: 828(R)
of meat, effects on proteins, 11: 3650
of meat, effects on proteolytic enzyme activity, 11: 2794(J)
review, 11: 3293(J)

Radiotherapy
anemia and leukemia following therapeutic doses of x radiation, 11: 9946(J)
applications of Au^{198}, 11: 8810(J)
application of colloidal radioactive chromic phosphate, 11: 6218
application of kilocurie Cs^{137} teletherapy machine in, 11: 11900(J)
applications of interstitial irradiation, 11: 3319(J)
applications of radioisotopes, 11: 4219(J), 6221(J), 6626(J), 10420(J), 10421(J), 11905(J)
biological protection against x rays in, of tumors, 11: 10419(J)
calibration of radioactive tantalum wire for use in, 11: 4940(J)
of cancer, augmentation of radiotherapeutic effects by chemotherapy, 11: 11897(J), 11899(J)
of chronic leukemia, 11: 8807(J)
of chronic leukemia with P^{32} and, x-ray irradiation, 11: 8808(J)
cobalt^{60} teletherapy unit, design, 11: 5981(J)
cobalt^{60} teletheraphy unit, effectiveness, 11: 60(J)
design of Co^{60} applicator, 11: 6625(J)
dosage determinations for, calibration of instruments, 11: 519(J)
dosage determinations for interstitial implants, 11: 4589(J)
dosage determination of β rays from Ce^{144} applicator, 11: 3316(J)
of early bladder carcinoma using Ta^{182} wire implants, 11: 62(J)
effectiveness of a kilocurie Co^{60} teletherapy unit compared with a 22 Mev betatron, 11: 59(J)
employing radioisotopes, book, 11: 11901(J)
of eye tumors employing radon and Co^{60} sources, 11: 6622(J)
of hemangiomas with Sr^{90} applicator, 11: 4258(J)
of hyperthyroidism with I^{131}, 11: 5178(J)
importance of facilities in general hospitals, 11: 8809(J)
with iodine^{131}, induction of sialitis, 11: 6216(J)
isodose plotting device for, 11: 8975(J)
of leukemia with P^{32}, 11: 4801(J)
of lip tumors with Co^{60} applicator, 11: 6623(J)
of malignant bladder lesions with radiocobalt needles, 11: 3672(J)
of malignant effusions with Au^{198}, 11: 2802(J), 4799(J)
of malignant tumors, 11: 4800(J), 7081(J)
of malignant tumors in animals, 11: 7080(J)

Radiotherapy (cont'd)
of malignant tumors with Co^{60} teletherapy, 11: 13251(J)
manual, 11: 8812(J)
materials and procedures, 11: 63(J)
nuclear reactor use in medical research and therapy, 11: 11394
physical considerations governing choice of radioisotopes, 11: 6219(J)
preparation of flexible filaments containing Y^{90} for, 11: 6624(J)
role of physical and medical scientists, 11: 9914(J)
of thyroid carcinoma with I^{124}, 11: 7079(J)
of thyrotoxicosis with I^{131}, 11: 3315(J)
transmission dose measurement for Co^{60} therapy unit, 11: 6474(J)
of tumors, applications of P^{32}, 11: 6217
of tumors, effects of chemical treatments, 11: 10418(J)
of tumors of maxillary antrum, 11: 4798(J)
of tumors of sinuses, 11: 3318(J)
of tumors of the hematopoietic system, applications of Bi isotopes, 11: 891(J)
of tumors of urinary bladder, 11: 3317(J)
use of trunk bridge in treatments of radiosensitive tumors, 11: 9972(J)
using radioactive colloidal materials, instrument for tissue distribution measurements, 11: 9974(J)
wedge filter design for use with 4 Mev linear accelerator, 11: 10330(J)
x-ray dose and wave range determination in osteogenic sarcoma, 11: 9970(J)

Radium
bone deposition, measurements, 11: 9001(J)
calibration for radiation source, 11: 5440
carcinogenicity, 11: 1392
coprecipitation with $BaSO_4$, 11: 2862(J)
decontamination of hands contaminated by, 11: 10414(J)
determination, 11: 9589(R)
determination in radioactive ore, 11: 2839(J)
encapsulated sources, radiation hazards, 11: 4796(J)
gamma analysis with a high-pressure ionization chamber, 11: 1429(R)
metabolism and pathological effects in dogs, 11: 5133(R), 11019(R)
metabolism in dogs, tracer study employing Ra^{226}, 11: 4808(J)
precipitation, $CaCO_3$ as carrier for, 11: 10813(R)
precipitation by MgF_2, $BaSO_4$, and $CaCO_3$, 11: 12405(R)
radiochemical determination in Congo ores, ionization chamber for, 11: 12971(R)
radiometric determination, self-absorption correction method, 11: 10858(R)
radiometric determination in food, water, and man, 11: 11929
radiometric determination in human tissue samples, 11: 67, 5179(R)
radiometric determination in U ores and residues, 11: 5781
radiometric determination of, in Th, 11: 13635
recovery from pitchblende, 11: 8385, 12376(R)
recovery from solid residues, 11: 9631(R)
recovery from U ore acid leach residues, 11: 9627(R)
removal, by calcium carbonate, 11: 12406(R)
retention following injection in rats, effects of vitamin D, 11: 13254(J)
separation and purification from pitchblende residue, 11: 11646(R)
separation from Ba by fractional crystallization, fractional precipitation, and ion exchange, 11: 12328(R)

Radium (cont'd)
separation from U, 11: 13013
sources, platinum K x rays from containers, 11: 6964(J)
standards, comparisons of, 11: 6569(J)
tissue distribution in man, 11: 12639(R)
toxicology, 11: 893

Radium cake
analysis for Ra, 11: 12328(R)
processing for Ra recovery, 11: 11646(R)
radium separation and purification, 11: 12328(R)
storage by drum and tank car, cost estimates of, 11: 11672

Radium isotopes
(Isotopes identified as RaA, RaB, etc., have been indexed as in the table below.)

For	See
RaA	Polonium isotopes Po^{218}
RaB	Lead isotopes Pb^{214}
RaC	Bismuth isotopes Bi^{214}
RaC′	Polonium isotopes Po^{214}
RaC′′	Thallium isotopes Tl^{210}
RaD	Lead isotopes Pb^{210}
RaE	Bismuth isotopes Bi^{210}
RaF	Polonium isotopes Po^{210}
RaG	Lead isotopes Pb^{207}

decay schemes, odd-parity rotational bands in even-even nuclei, 11: 13461(J)
isotopic abundance, comparison of U^{238}, U^{235} and, ratios in Colorado Plateau U ores, 11: 5867(J)
radiometric determination, 11: 12639(R)
thermal neutron cross sections, review, 11: 10245

Radium isotopes Ra^{222}
alpha and γ spectra and decay schemes, 11: 780(J)
conversion-electron spectrum and energy levels, 11: 781(J)

Radium isotopes Ra^{223}
alpha, electron, and gamma spectra and decay scheme, 11: 12933
alpha-gamma coincidence spectra, 11: 4814(R)

Radium isotopes Ra^{224}
excretion, following administration of Thorotrast to human patients, 11: 11904(J)
therapeutic uses, 11: 11893(J)
tissue distribution in dogs, 11: 4807(J)

Radium isotopes Ra^{226}
decay schemes, 11: 778(J)
fission and spallation competition, 11: 12268
neutron total cross section from 0.022 to 50 ev, 11: 5558(J)
permissible limits, revisions in computation, 11: 2234
radiochemical determination, 11: 13551(J)
radiometric determination in human subjects by external counting, 11: 7291(R)
radiometric determination in urine samples, 11: 7920(R)

Radium isotopes Ra^{228}
alpha emission in, search for, 11: 9166(J)
excretion, following administration of Thorotrast to human patients, 11: 11904(J)
separation during Th metal production, 11: 7674

Radium needles
See Radioapplicators.

Radium ores
particle sorting by degree of radioactivity, 11: 5100(P)

Radium plaques
See Radioapplicators.

Radium poisoning
history of fatal case, 11: 8814(J)
in man, clinical data, 11: 12639(R)
radon breath concentration determinations during, 11: 8813(J)
role of Th^{228} in, 11: 5133(R)
therapy with Vitamin A alone and with Ca-EDTA complex, 11: 1760(J)

Radium sulfates
barium sulfate carrier precipitation of, in Th raffinate decontamination, 11: 13635

Radon
adsorption on activated charcoal, 11: 5179(R)
atmospheric diffusion, meteorological factors affecting, 11: 5749(J)
detection and control in U mines, 11: 56(J), 1753(J)
detection and measurement in breath, 11: 8813(J), 9001(J)
determination in air, 11: 3305(J)
determination in liquids, 11: 12149(J)
effect on lungs, 11: 56(J)
effects in drill holes on gamma-ray logs, 11: 11192(J)
gamma sources for radiography, calibration, 11: 11311(J)
inhaled, pathomorphological effects on animals, 11: 5725(J)
physical properties of aerosols, 11: 8838
radiometric analysis, 11: 12328(R)
radiometric determination, 11: 10811(R)
radiometric determination in air samples, 11: 6211, 7291(R)
radiometric determination in cylindrical ionization chambers, 11: 10177
radiometric determination in water, 11: 1244
radiometric determination of, plus decay products, in air, 11: 11941(J)
radiometric determination of low levels, 11: 4590(J)
tissue distribution, as determined by Po retention and excretion in rats and man, 11: 109

Radon isotopes
alpha-decay properties and electron capture, 11: 6551(J)

Radon isotopes Rn^{218}
alpha and γ spectra and decay schemes, 11: 780(J)
conversion-electron spectrum and energy levels, 11: 781(J)

Radon isotopes Rn^{219}
alpha, electron, and gamma spectra and decay scheme, 11: 12933

Radon isotopes Rn^{220}
handling, hazards and safety precautions, 11: 13567

Radon isotopes Rn^{222}
radiochemical determination, 11: 13551(J)

Rain water
detection of P^{32} and P^{33} in, 11: 5419(J)
determination of S^{35} produced by cosmic radiation in, 11: 3447(J)
radioactivity, 11: 4177(J), 6472, 6963
radiological monitoring, 11: 11040(J)
radiometric analysis for fission product activity, 11: 7066
radiometric analysis for Sr^{90}, 11: 1592(J)

Rain water (cont'd)
scavenging of radioactive particulate matter from the atmosphere by, 11: 9957(J)

RaLa Process
analytical control using 1 milliliter sample, 11: 8293
decontamination, effect of filtration and centrifugation, 11: 7552
development, 11: 11607(R), 11733(R)
development for MTR-element processing, 11: 7556
flow sheets and product standards, 11: 13637(R)
ion exchange process for Ba^{140} purification, 11: 9659
pilot plants for removal of Ba^{140} from MTR fuel, 11: 9625
radiation damage in, due to MTR fuel rods, 11: 13206

Raleigh Research Reactor
See North Carolina Research Reactor.

Ralston Creek Area (Colo.)
geology and mineralogy, 11: 1118(J)

Raman effect
low-pressure Hg lamp for studying, 11: 8234(J)
polarization measurements, 11: 7372(J)

Rand ores
See Uranium ores.

Rare earth acetates
preparation of anhydrous, 11: 5815(J)

Rare earth chlorides
absorption spectra and molar extinction coefficients, 11: 4352(J)
hydrolysis in vapor phase, 11: 12341(R)

Rare earth complexes
absorption spectra of lanthanide, variation of parameters of electrostatic interaction derived from, 11: 2853(J)

Rare earth compounds
coprecipitation of iodates with $Th(IO_3)_4$, 11: 1469
neutron-diffraction analysis, 11: 4016(R)
preparation, properties, and superconductivity, 11: 11484

Rare earth deposits (U.S.)
bibliography on, 11: 11188

Rare earth fluorides
crystallographic data, 11: 6431(J)
reactions with F_2, 11: 3330(R)

Rare earth ions
energy levels in, 11: 10364(J)
spectra of, in crystalline compounds, 11: 10007(J)

Rare earth isotopes
chromatographic separation of, from Yb and Hf fission induced by high energy protons, 11: 1834(J)
isomeric transitions, 11: 9518(J)
isomeric transitions in Tb^{156m}, Ho^{160m}, Er^{167m}, Er^{169m}, and Yb^{171m}, 11: 10363(J)
preparation of fission, 11: 7134

Rare earth minerals
concentration of the rare earths before processing, 11: 5819(J)
kupletskit, new in astrophyllite group, 11: 1083(J)

Rare earth nitrates
thermolysis, 11: 972(J)

Rare earth oxides
sinterability at various temperatures in oxidizing and reducing conditions, 11: 970
spectrographic analysis for rare earths, 11: 13287(J)
x-ray data, 11: 3391(J)

Rare earth sulfates
adsorption from homogeneous reactor solutions by CaF_2, 11: 11662
precipitation from HRT fuel, 11: 7859(R)
precipitation from reactor solutions, 11: 13951(R)
separation by hydroclones, efficiency, 11: 7500(R)
solubility in $UO_2SO_4-H_2SO_4$ solution, 11: 8382(R), 8383(R)

Rare earths
(See also Actinides.)
absorption spectra in crystals and solutions, 11: 7430(R)
absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969
adsorption, 11: 13641
adsorption from UO_2SO_4 fuel solution by CaF_2, 11: 8382(R)
bone deposition, 11: 1468(J)
carrying by $BiPO_4$ precipitation, 11: 7460
catalytic properties, 11: 4353(J)
chemical properties, 11: 9591(R)
chromatographic-spectrographic determination in Th, 11: 7435
concentration and decontamination using CaC_2O_4 carrier, 11: 13297(J)
coprecipitation with bismuth phosphate, 11: 12370
Coulomb excitation and cascade decay of rotational states in odd-mass, 11: 2079(J)
determination in monazite sand, 11: 5208
determination in solutions containing Th, 11: 10829(R)
determination in Thorex Process streams, 11: 3697
determination in Th, 11: 12406(R)
determination in Th by precipitation, 11: 12404(R)
determination of lanthanons in monazite, 11: 6658(J)
diffusion of, as activators into crystalline phosphors, luminescence spectra, 11: 12297(J)
distribution in alloys, 11: 13883(R)
fission yield determination by 4π counting, sample preparation, 11: 6834(J)
fractionation, using HCl–butyl phosphate, 11: 13633(R)
intrusions in volcanic rocks, review, 11: 296(J)
ion exchange of thiocyanate complexes, 11: 5249(J)
ion exchange separation and preparation, 11: 12322(R)
ion-exchange separation by elution with ammonium α-hydroxy isobutyrate, 11: 1003(J)
ion-exchange separation equipment, 11: 971(J)
ion exchange using ENTA, 11: 6302(J)
isotopic composition of, formed by fission of U, Th, and Bi, with 680-Mev protons, 11: 9169(J)
liquid-liquid extraction of mixtures, 11: 11701(R)
luminescence spectra in prepared fluorite crystals, 11: 787(J)
magnetic susceptibilities of La, Ce, Pr, Nd, and Sm from 1.5 to 300°K, 11: 9171(J)
mass spectrometric investigation for existence of new isotopes, 11: 4178(J)
metallic phase transitions, 11: 8117(R)
metallurgy, 11: 11700(R)
neutron cross sections, 11: 10229

Rare earths (cont'd)
nuclear chemical properties, 11: 8282(R)
physical and chemical properties, 11: 5816(J)
preparation, properties, and separation, 11: 10428(R), 13083(R)
preparation, properties, and superconductivity, 11: 11484
production by Ca or Mg reduction of the halides and oxides, 11: 1538(R)
properties for reactor control materials, 11: 3617(J)
radioactive isotopes formed by spallation, 11: 6572(J)
radiochemical determination of U^{235} fission produced, 11: 3708(J)
recovery from monazites by precipitation, 11: 11625
separation by ion exchange, 11: 4376(J), 4810(R), 12330(R), 12341(R)
separation by ion exchange and analysis by spectroscopic methods, 11: 7692(R)
separation by ion exchange using EDTA and citric acid as eluants, 11: 195(J), 11513(P)
separation by means of varying resin column operating temperatures, 11: 6286(J)
separation by solvent extraction, 11: 1810(R), 2420, 8508(R)
separation from fission products, 11: 7430(R)
separation from Ru, Te, and Cs using anion exchange, 11: 9263(J)
separation from Th, 11: 8296(R)
separation from Th and U in monazite processing, 11: 13634
separation from U by liquid Mg and fused F^- extractions, 11: 7545(R)
separation of Am from, by ion exchange, 11: 4844(J), 9259(J)
separation of fission product, from liquid U–Bi fuel, 11: 8331
separation of U from, by chelation with di(salicylal) alkylenediimine, 11: 5095(P)
separation of U from, by ion exchange, 11: 9262(J)
separation of U from, by solvent extraction with TBP, 11: 9261(J)
separation of U from, complexing with KF and NH_4F, 11: 6315(J)
separations chemistry, 11: 3935(R)
solubilities and conductances in ethylenediamine, 11: 11118(J)
solubility equilibria in TBP systems, 11: 11111
solvent extraction, 11: 10475(R), 11703(R)
solvent extraction behavior, 11: 9578(R)
solvent extraction by di(2-ethylhexyl) phosphoric acid, 11: 10036(R)
solvent extraction from monazite, 11: 7675
solvent extraction of lanthanides as their di-alkyl orthophosphates, 11: 11117(J)
solvent extraction of lanthanides in TBP–HNO_3 systems, nonmonotonic ordering, 11: 11116(J)
solvent extraction separation of lower lanthanides using TBP, 11: 11115(J)
spectrochemical analysis, 11: 12405(R)
spectrographic determination in rare earth oxides, 11: 13287(J)
spectrographic determination in TBP process solutions, 11: 10810(R)
spectrographic determination in U, 11: 8404, 12971(R)
spectrographic determination in U and UF_4, 11: 12352(R)
spectrophotometric determination in aqueous solutions, 11: 117(J)
systematic variation in Ce–earth minerals, 11: 5865(J)
thermal expansion of La, Ce, Pr, Nd, Gd, Tb, Dy, Er, and Yb metals at temperatures up to 900°C, 11: 4750(J)
thermodynamic properties, 11: 6713
thorium separation from, by peroxide precipitation, 11: 9589(R)

Rare earths (cont'd)
tissue distribution and excretion in rats, effects of EDTA treatment, 11: 9191(J)
toxic effects following injection in laboratory animals, effects of complexing agents, 11: 2804(J)
volatilization and liquid metal and molten salt extractions from irradiated U and Th–U alloys, 11: 7546(R)
volumetric determination using azoxine indicator, 11: 6261(J)
in yttrotungstite, 11: 10466(J)

Rare gases
(See also the specific elements in the group.)
chromatographic separation and analysis, 11: 113(J)
collisions between metastable He atoms and, total cross sections for, 11: 11295(J)
diffusion in reactor fuel rods, 11: 9741
diffusion processes studied by diffusion of fission Kr from metallic U, 11: 1218(J)
electric discharge in, investigation of instantaneous brightness, 11: 10604(J)
formation in fission, pressure buildup by, 11: 8664
mass spectrometer for analysis, 11: 3943(J)
nuclear relaxation time in, 11: 447(J)
scintillation pulse height and resolution, 11: 10232(R)
thermo-osmosis through a rubber membrane, 11: 8970(J)

Raschig rings
See Column packing.

Rate meters
(See also Radiation detection instruments (ion current type).)
circuits for, random interchange of, 11: 12146(J)
design and performance of radiation survey equipment, 11: 2978
design of, for measuring γ dosage, 11: 10658(J)
design of, using $MgO-Al_2O_3$ crystal, 11: 11553(P)
design of continuous $\beta-\gamma$, for monitoring liquid streams, 11: 3477
design of extended probe survey type, 11: 1239
design of wide-range $\beta-\gamma$, 11: 6868(R)
design using count integrating circuits, 11: 4536
development of photoconductive crystal detectors, 11: 4570
performance, 11: 8792(R)
performance as $\beta-\gamma$ dosimeters, 11: 8793(R)
performance for surface dose-rate measurements, 11: 6209(R)
performance for x-ray dosimetry, 11: 6469
performance of halogen quenched Geiger counters, 11: 2977
probe-type employing scintillation detectors, performance for radiation dosimetry, 11: 4942(J)

Rats
acute x-ray lethality, 11: 11869(J)
diaphragm uptake and retention of thyroxine and triiodothyronine hormones, 11: 9977(J)
distribution of Ba in, tracer study, 11: 9209(J)
effects of feeding fat emulsion on survival of irradiated, 11: 8805(J)
effects of x rays on adrenal glands, 11: 1731(J)
effects of x rays on blood constituents of new-born, 11: 9195(J)
lethal radiation dosage determinations, 11: 6596(R), 10395, 11857(J)
protection against radiation by cysteinamine peritoneally administered, 11: 9204(J)
radiation effects, 10803(R)

Rats (cont'd)
radiation effects on enzymatic activity of tissues toward uridine, uridylic acid, cytidine, and cytidylic acid in, 11: 8779(J)
radiosensitivity, 11: 8768(J), 8795(J), 12642(R)
radiosensitivity, effects of dose rate and age, 11: 850(J)
radiosensitivity, effect of hypothermia on, 11: 9198(J)

RDX
See Hexogen.

Reaction mechanisms
(See also Organic syntheses; Photochemistry; Photosynthesis; Solid state reactions; Gaseous reactions; Szilard-Chalmers reactions.)
determination of kinetic characteristics of exothermic heterogeneous reactions, 11: 6635(J)
diffusion boundary current method for study, 11: 1418(J)
in irradiated gels, colorimetric measurement, 11: 13282
isotope effects, 11: 4555(J)
isotope methods of investigation, review, 11: 10488(J)
kinetics of gases, 11: 4530(J)
kinetics of very rapid ion reactions in aqueous solutions, 11: 11922(J)
mathematical analysis in continuous-flow, stirred-vessel reactor systems, 11: 7087
pinacol rearrangement, 11: 11576(R)
review of solution kinetics, 11: 4270(J)
tables, 11: 4819(J)
Wagner rearrangement, 11: 8284(R)

Reaction Motors, Inc., Denville, N. J.
progress reports on high temperature stable semiorganic fluids, 11: 12712(R)

Reactions
See Chain reactions; Gaseous reactions; High-temperature reactions; Nuclear reactions; Szilard-Chalmers reactions; Thermonuclear reactions.

Reactivity Measurement Facility
(See also Danger Coefficient Test Facility.)
accessories, 11: 12888(R)
cross section measurement oscillator installation, 11: 9052(R)
design, for reactor matrices, 11: 2679
reactivity values calculated from inhour equation, table, 11: 8171
two-group three-region cylindrical approximation calculations, 11: 2693

Reactor atmospheres
(See also Reactor coolants.)
purification of He, of SRE, 11: 7847(R)

Reactor breeding blankets
aqueous processing by solvent extraction, precipitation, adsorption and electrochemical methods, 11: 8384
casting of EBR, 11: 7720
chemical forms for Th, 11: 4701(J)
chemical processing principles, 11: 188(J)
chemical properties of aqueous, 11: 10973
cleaning procedures for HRT, 11: 8653
continuous processing, 11: 7732(R)
coolant flow pressure drop for PWR, 11: 1330
design and specifications, 11: 7727
design of boiling, for TBR, 11: 10966

Reactor breeding blankets (cont'd)
design of optimal external, 11: 12572
design of PWR, 11: 10988(R)
development of Th, status of, 11: 8598
development of ThO_2-type, 11: 2653
dumping pressure-time relationship, 11: 2672
dump tanks of HRT, testing, 11: 8649
dump tank specifications of HRT, criticality factors, 11: 7791
efficiency in TBR, 11: 2658
fission and corrosion product removal from HRT, 11: 13657
fission product poisoning and fuel processing period, 11: 2724
fluidized thorium oxide, feasibility, 11: 13900
heat production rate in ThO_2 slurries, 11: 2668
heat transfer in ISHR, use of core solution for, 11: 7776
heating of HRT, procedures, 11: 8655
hydrostatic testing of HRT, 11: 8652
for liquid metal fuel reactors, 11: 1661(J)
mockup of HRT, design, 11: 7859(R)
neutron leakage by resonance capture in Th, 11: 2643, 8597
power removal from boiling ThO_2 slurry, 11: 7783, 7808
processing, 11: 7691(R)
processing and recovery costs of U^{233} from, 11: 9618
processing costs of $Th(N^{15}O_3)_4-D_2O$ solution, 11: 2111
processing flowsheets, 11: 13642
processing of, for U and Th recovery, 11: 13884(R)
processing of homogeneous, and production of Pu^{240}, 11: 8678
processing of HRT, 11: 7805
processing system for HRT, instrumentation, 11: 9822
processing with fuel solution, 11: 4677
storage tanks for HRT, test procedures, 11: 8646
temperature distribution, 11: 9711(R)
testing of slurry, failure of let-down valve in, 11: 9825
thermal stability of aqueous thorium nitrate solutions, 11: 5567
variation of breeding ratio with Th blanket concentration, 11: 8599
for Zephyr, performance of Th, 11: 7321

Reactor catastrophe studies
See Reactor safety.

Reactor components
cleaning and pickling of core components, quality control coupons, subassemblies, and bundles, 11: 11804
corrosion by reactor slurries, 11: 7716
design of boilers, turbines, and cores, 11: 5036(J)
design of dump tanks and piping for HRT, 11: 2651
development and fabrication of SRE, 11: 5028
inspection of Argonne water loop, 11: 11746(R)
leak detection practices for HRT, 11: 8645
performance of pumps, high pressure components, valve controls, and instruments in HRT mock-up, 11: 11771
physical response during a power excursion, 11: 11747(R)
reaction between O_2 and Na, effect on reactor housing, 11: 670(J)
stress-corrosion cracking in HRT leak detector system, 11: 4678
testing, exponential pile design for, 11: 648
testing of MTR, before startup, 11: 1658

Reactor components (cont'd)
torquing of bolts, 11: 6084
Reactor conferences
Chalk River, Jan. 9 to 12, 1956, 11: 5018, 7326
forum on SRE-OMRE at Los Angeles, Calif., Nov. 8 and 9, 1956, 11: 5028
Los Angeles, Oct. 11, 12, and 13, 1951, 11: 13965
Reactor control elements
ball nut and screw operating position, 11: 2730
ball-type, for SRE, 11: 8688(R)
bearings for SIR, testing, 11: 13153
brazed poison tube header assembly for the control cylinder, 11: 11796
corrosion by crud, 11: 13995
corrosion of boron-stainless steel alloys in 680°F water, 11: 11185
design and operation of reluctance motor drive, 11: 13991
design and performance for Borax experiments, 11: 11744(R)
design for SRE, 11: 7846(R)
design of electromagnetic rod drive, 11: 8976(J)
design of ETR rod magnets, 11: 13430(R)
development and testing, 11: 5025(R)
development of B-stainless steel and Cd–In–Ag, 11: 12751
development of BF_3 safety, 11: 9844(R)
development of B–Ti systems for, 11: 13079
development of drive mechanisms, 11: 13868(R)
development of safety devices at NAA, 11: 11424(R)
development of sensors for reactor safety fuses, 11: 11794
device for injecting Cd or B balls, 11: 5105(P)
directional property of magnetic saturation in design of position indicator, 11: 11815
effectiveness of materials, 11: 10722
fabrication, 11: 13182
fabrication and nondestructive testing of Hf rods, 11: 14001
fabrication and reactor criticality effects, 11: 8689(R)
fabrication of, for critical assembly tests for SAR, 11: 12742
fabrication of Ag–Cd–stainless steel clad, 11: 12589
loading with $B^{10}F_3$, 11: 4096
materials for PWR, 11: 12244, 12245
neutron flux behavior near, 11: 13487
pressure testing poison tubes, 11: 12447
studies, for standardization, 11: 7717
testing of, for Submarine Advanced Reactor, 11: 10733
testing of BF_3 safety fuzes, 11: 8692
testing SRE Mark I and II, 11: 10736(R), 13503(R)
transient behavior of prototype fuse in simulated reactor excursions, 11: 5586
transient heating test of enriched fuse elements, 11: 7726
Reactor control rods
(See also Reactor control systems; Servomechanisms.)
acceptance tests and specifications for stainless steel clad boron steel, 11: 11419
burnout of B^{10} in, method of calculating, 11: 12544
burnup analysis of materials, 11: 11745(R)
burnup data and irradiation tests on APPR, 11: 5009
calibration, rod-oscillator method for, 11: 11813
Reactor control rods (cont'd)
calibration experiments and calculations for APPR-1, 11: 7322
calibration of, by scram transient analysis, 11: 7821
calibration techniques, 11: 4100, 8185(J)
casting and thermal cycling of EBR, 11: 7720
cladding Cu–B_4C and Ag–Cd–In, 11: 10988(R)
cost comparison of B-stainless steel and Hf, 11: 11748(R)
design, 11: 7727, 7842(R)
design for Calder Hall, 11: 3084(J)
design of EBWR B-stainless steel, 11: 11748(R)
design of HRE, 11: 7762
design of rod gripper or holder for, 11: 11529(P)
development of cermets for, 11: 11673
dimensional stability of hafnium, 11: 11750
drive mechanism design (electromagnetic), for underwater use, 11: 8976(J)
drive mechanism designs for BER, 11: 11745(R)
drive unit testing, 11: 10923(R)
dynamic irradiation program for Cd–In–Ag alloy for, 11: 11957
effectiveness of absorbers sensitive to neutrons of all energies, mathematical analysis, 11: 6523
effectiveness of BEPO, calculations, 11: 6525
effectiveness of disconnected, in relation to diameter, number, and arrangement, 11: 6904
effectiveness of disconnecting, of thermal reactors, 11: 9487(J)
fabrication, 11: 12753
fabrication of Y-shaped Ti-powder, 11: 11706
mathematical analysis of, for LMFRE, 11: 12218, 12219
needle thermocouples for, of Experimental Breeder Reactor, 11: 13763(R)
neutron absorption and effectiveness, 11: 1659
neutron absorption area method applied to 3-group diffusion, 11: 12238
neutron flux suppression in APPR, 11: 13878
nuclear evaluation of slab type, 11: 4091
open type electromagnets for use with, 11: 13729
operation of EBR, 11: 4664(R)
power peaking in rod channels, 11: 10299
properties of rare earths for use as, 11: 3617(J)
radioactivity induced in MTR Be, 11: 1328
reactivity, measurement by reactor scram transient analysis, 11: 7821
reversing time of materials testing reactor mockup, 11: 13148
rings and screws for SGR, 11: 7848(R)
scram-time relationship of EBWR, 11: 11747(R)
solid state reaction studies of materials for, 11: 13881
testing equipment, 11: 11745(R)
testing of APPR-1, 11: 12550
testing of SRE prototype, 11: 4095(R)
theory of, experimental checks, 11: 682(J)
thermal cycling and instrumentation of EBWR, 11: 11747(R)
use of gadolinium alloys as, 11: 12356
welding Hf to Zircaloy 2, 11: 13821
Reactor control systems
(See also Reactor control rods; Servomechanisms.)
analysis of, for PuP #30C, 11: 8699
automation, 11: 681(J)
bibliography of classified and unclassified reports, 11: 644

Reactor control systems (cont'd)
chemical aspects of, 11: 13508
control rod drive mechanisms, design, 11: 13864(R)
description of, for DIDO, 11: 3566(J)
design, 11: 10748(J)
design, fabrication, 11: 13189(R)
design and development of PWR, 11: 6909(R)
design and operation of reluctance motor drive coupled to control rods, 11: 13991
design and theory, 11: 663(J)
design considerations for more safety in, 11: 9134(J)
design for ETR, 11: 5611(J)
design for maximum possible reactivity, 11: 666(J)
design for MTR, 11: 641
design of, using soluble poisons, 11: 13867
design of control panel for HRE, 11: 2649
design of control rod drive mechanism, 11: 7031(P)
design of HRT, 11: 4106(J), 7796
design of MTR shim rods, 11: 8677(R)
design of OMRE, 11: 6087(R)
design studies, 11: 5616(J)
design using reflectors with holes for controlling neutron loss, 11: 9565(P)
design using tubular rods, 11: 7026(P)
development of coolant pressure regulated, 11: 12903
development of early, 11: 8581
development of OMRE, 11: 12895(R)
device for injecting Cd or B balls, 11: 5105(P)
diagrams and description of MTR Mockup, 11: 8705(R)
digital techniques applied to, 11: 11428
drive mechanism for rods, testing, 11: 2727
electronic trip system for reactor protection, design, 11: 2696
high-speed motion pictures of, 11: 12561
interaction of SRE nuclear and power plant controls, 11: 12872
ionization chamber for use in, 11: 4943(J)
mathematical analysis of scram motion, 11: 13946
modifications in PWR, 11: 12608(R)
neutron flux instrumentation, 11: 682(J)
power level control using ionization chamber, optical galvanometer, and several photoelectric cells, 11: 5118(P)
reactivity equivalents, determination, 11: 4103(J)
temperature control servomechanism for ARE, 11: 13130
testing hydraulic and magnetic rod mechanisms for, 11: 11748(R)
using D_2O additions in graphite moderator, 11: 2116(R)

Reactor coolants
activation by a fuel element with a hole in the end closure, 11: 11747(R)
bibliographies on organic, 11: 4655
bismuth and Bi–Pb eutectic absorbed by graphite, 11: 7446
boiling detection in, 11: 13717
chemical analysis for radionuclides, 11: 9479
corrosive effects, 11: 3783(R), 4407(R), 5309, 5310, 5832(J), 6700(R)
corrosive effects on hot-pressed, extruded and vacuum cast Be, 11: 7619

Reactor coolants (cont'd)
corrosive effects on reactor materials, 11: 227
development of ceramic-gas systems, 11: 1317
evaluation of organic compounds for Hanford, 11: 12228
flow, measurement with fast differential pressure transducer, 11: 3467
flow characteristics in SRE fuel assemblies, 11: 4107(J)
flow in core of PWR, 11: 1501
flow velocity, effect on core wall temperature in the APPR, 11: 13875
heat removal, 11: 6918(J), 12602
heat transfer and corrosive effects of organic compounds, 11: 2889
high-temperature properties, 11: 11916
high-temperature properties, survey, 11: 4697(J)
hot channel factor re-evaluation for APPR-1, 11: 7323
impurity activation and demineralizer shielding for SAR primary, 11: 10957
metals, purification by fractionating fusion, 11: 5702(P)
monitoring, at Hanford, 11: 13852
monitoring system for PWR, 11: 8179
physical and nuclear properties, 11: 8575
physical properties, 11: 13597(R)
power removal characteristics of various, 11: 2700
properties of Pb and Na, 11: 8695
radiation effects on proposed organic, 11: 12985
radiation monitoring equipment for, design, 11: 1240
radioactive contamination of MTR, 11: 4685(R)
radioactivity, method of computing, 11: 656
radiochemical analysis for P^{32}, 11: 936(J)
reactor radiation effects, 11: 963
sampling and determination of gas and H content in SAR, 11: 4092
shielding requirements for liquid metal, 11: 12629
steam cycles in nuclear power plants using water as, 11: 6917(J)
testing, stability, decomposition products, corrosive effects on structural materials, effects of radiation on, 11: 5190
tetralin, properties of, for SGR, 11: 7848(R)
treatment by ion exchange, 11: 6299(J)
use as γ source, 11: 14027
use of organic compounds as, 11: 12905(J)

Reactor cooling systems
bellows for SIG Na, testing, 11: 4920
channel dimension deviations in, effect on thermal parameters affected, 11: 1340(J)
cleaning, removal of Na and Na sludges with NH_3 and NH_3–NH_4Cl system, 11: 12669
cleaning of HRT with 10% phosphoric acid solution, 11: 9099
cleanup system for carbon steel high temperature H_2O recirculation system, 11: 2682
computer study of steam pressurizers, 11: 633
contamination, effect of fission product diffusion into, 11: 11712
contamination, effect of surface finish on, 11: 8711
coolant flow, meter design for measuring, 11: 13932
coolant flow in SRE, 11: 4107(J)
corrosion inhibitors for HRT closed and tower water systems, 11: 11399
corrosion problems in pressurized water, 11: 13501
corrosion product activity buildup in pressurized water, 11: 13501

Reactor cooling systems (cont'd)
corrosion products in, measurement of, 11: 12032(J)
corrosion products in liquid metal, 11: 8446
cost comparison of stainless steel and Cr–Mo, for sodium reactors, 11: 10736(R)
decontamination, testing solutions for, 11: 10988(R)
decontamination of pressurized water, 11: 13501
decontamination of Na system components, 11: 7931
design and development of PWR, 11: 6909(R)
design and operation of primary, for ETR, 11: 5612(J)
design and performance of standby cooling system mockup for KAPL Intermediate Power Breeder, 11: 7834
design for dual-purpose reactors, 11: 13919
design for Marcoule, France reactors, 11: 10741(J)
design of He, for Pu breeder, 11: 7739
design of intermittent Hg flow system, 11: 11535(P)
design of MTR, 11: 7747
design of natural convection emergency, for EBR-II, 11: 11748(R)
design of SRE, 11: 7848(R), 13969(R)
design of tower-type, 11: 9791
development of pressure regulated, for reactor control, 11: 12903
dose rate, effects of shielding on, 11: 2196
evaluation of HRT, 11: 10938
for fast reactors, variation in critical mass for various, 11: 8682
fission product removal, proposed program for PWR, 11: 13992
flow characteristics in EBR-II, 11: 6521(R)
gas, characteristics, 11: 6928(J)
graphite core design for improved, 11: 7030(P)
heat transfer in liquid metal, calculation of transient and steady-state, 11: 2701
heat transfer properties of Calder Hall, 11: 3084(J)
identification, source, and control of radionuclides in, 11: 9479
leak detection, radioactive methods, 11: 6700(R)
leakage flows, 11: 13499
leaks, Na^{24} and I^{131} air contamination from, 11: 11427
liquid metal, design, 11: 3260(P)
materials considered for, availability and costs, 11: 2775(J)
mathematical analysis of hydraulic flow transients, 11: 12893
modifications of HRT, 11: 9812
operating conditions of modified HRT, 11: 9814(R)
oxygen control in Na heat-transfer systems, 11: 249(J)
performance of HRT cooling tower, 11: 9800
plenum flow distribution and time constants, 11: 13310
plenum mixing and flow constants in, methods for determining, 11: 13500
pumps for, testing, 11: 2731, 3801
for PWR, technology, 11: 247(J)
radioactive accessibility to SAR, 11: 2706
radioactivity, method of computing, 11: 656
re-use of water in, 11: 2137(J)
review, 11: 9117(J)
shielding problems presented by, radiation absorption by pebbles applied to, 11: 12628
shielding requirements, 11: 13220
slug rupture detection by fission product counting in, 11: 3491(J)

Reactor cooling systems (cont'd)
stress analysis of S3G/S4G emergency condenser, 11: 12237
theory of channel design, 11: 5588
thermal insluation of EBR, 11: 4664(R)
for thermal reactors, properties of liquid Mg in, 11: 8672
transfer of activity in stainless steel-liquid Na, 11: 3818(J)
valves for primary, design, 11: 12608(R)
velocity in, estimation of most economical, 11: 8606

Reactor engineering
bibliographies on liquid metal fueled reactors, 11: 6883
book, 11: 5832(J)
book, introduction to physics of, 11: 12267(J)
computer uses in, 11: 6804(J), 6809(J)
criticality studies, reactivity, and group theory of BER, EBR-II, and PBR, 11: 11745(R)
curriculum of ORSORT, 11: 13913
design and construction, theory, 11: 2129(J)
design evaluation program, 11: 9873(R)
design of Shielding Experiments Reactor, 11: 4685(R)
design problems, 11: 6186(J)
design studies for pressurized water power reactors, 11: 4694(R), 6095(R)
developments at Brookhaven, 11: 4487(R)
fission processes, 11: 3560(J)
lectures from a course at Brookhaven, 11: 12525
moderators, coolants, and fuel cycles in advanced, lecture on, 11: 2128(J)
numerical methods in, 11: 10305(J)
physics of, book, 11: 8189(J)
power reactor development, 11: 8635
procedures for designing hypothetical reactor core, 11: 6085
review of work on control, cooling, design, shielding, development tests, and process engineering, 11: 11785(R)
stress and thermal analysis techniques developed at Westinghouse, 11: 12242
study of a 180-Mw heterogeneous boiling reactor power plant, 11: 12583
technical and pictorial summary of experimental power and test reactors, 11: 3078

Reactor experimental facilities
development, 11: 13142
loops for diphenyl irradiation stability studies, 11: 9610
reactivity effects, 11: 1669(J)
vertical hydraulic rabbit, evaluation as irradiation facility, 11: 14006

Reactor fuel alloys
corrosion in 680°F water, 11: 6351
fabrication and heat treatment of fissium alloy of U–Mo–Ru–Pd–Rh and Zr, 11: 1124
heating tests on fissium alloy pins, 11: 6521(R)
preparation, physical properties, and high-temperature applications, 11: 5702
purification by liquid-metal extraction, 11: 2871(J)
radiation effects on corrosion-resistant, 11: 10354(J)
tensile properties and stability in thermal cycling of fissium alloy of U–Mo–Ru–Pd–Rh and Zr, 11: 1124
testing procedures, 11: 13188
thermal cycling of fissium, 11: 11748(R)

Reactor fuel alloys (cont'd)
thermal expansion and tensile properties of fissium alloys, 11: 13042

Reactor fuel alloys (liquid)
chemical properties of, for LMFR, 11: 10925(R)
corrosive effects, 11: 11752(R)
decontamination, 11: 10747(J)
phase studies, 11: 13080
processing flowsheet, 11: 13885(R)
properties, 11: 7709(R)
separation of Pu and fission products from , 11: 7545(R)
static corrosion of metals and alloys by, 11: 9747

Reactor fuel disks
design and storage for a dual purpose reactor, 11: 11784
temperature distribution of simulated, 11: 2434

Reactor fuel elements
(See also Long cartridges; Reactor fuel alloys (liquid); Reactor fuel disks; Reactor fuel plates; Reactor fuel rods; Reactor fuel wires; Slug elements.)
abrasive cutoff machine for sectioning, 11: 10089
activity release, effect of H_2O erosion, 11: 13759
analysis of ETR, for B content, 11: 13926
analysis of high-burnup, 11: 11406
analysis for volatile fission products, 11: 12973(R)
bibliographies of U–Mo program, 11: 11731
boiling, heat transfer, and stress in, effects of fins and spacers on, 11: 10982
boiling burnout analysis, 11: 6705(R)
boiling heat transfer coefficients at burnout, 11: 2735
buckling, 11: 11407(R)
buildup of U isotopes in, heat treatment and design of, handling systems, and cooling characteristics of SGR, 11: 7848(R)
burnout, effects of coolant flow direction on, 11: 6333
burnout, in-pile tests, 11: 12606
burnout data for long rectangular channels at 2000 psia, 11: 10296, 10297, 10298
burnout detector for testing, 11: 1962
burnout heat flux in rectangular channels, 11: 1033
casting of chromium–uranium alloy, 11: 8469
casting of U-Cr radiator-type, 11: 8467
centrifugal casting of, equipment and methods, 11: 7723
chemical processing for fuel recovery, 11: 6304(J)
cladding, with Zr, 11: 8717(R)
cladding materials for water moderated PuP, 11: 8698
cleaning and pickling, 11: 11804
convection heat transfer and friction correlations, 11: 654
coolant flow and heat transfer in parallel rod, with mixing, 11: 6332
coolant flow through, measurement of, 11: 4659
corrosion in storage basin water, 11: 8458
corrosion product deposition on, prevention, 11: 9783
corrosion products from canning defects, transport of radioactive, 11: 10878
corrosion studies of BSF, 11: 13178
corrosion test procedure for, containing Zr, 11: 7622

Reactor fuel elements (cont'd)
corrosion testing, 11: 10987(R)
cost factors of AMF closed cycle boiling water, 11: 4663
criticality studies, 11: 8685(R)
criticality studies, design, analysis of thermal performance, fabrication, economic aspects, and reprocessing, 11: 7727
criticality studies of solid and hollow, 11: 5493(R)
criticality studies of ZPR-I after loading with G.E.-type, 11: 7722
cutting under water, 11: 3379
decay-heat cooling of spent, from EBR-2, 11: 3082(J)
decladding by HNO_3 dissolution, 11: 7507(R)
deflection in plate-type due to pressure differentials, 11: 5013
deformation of MTR, in static pressure tests, 11: 2660
deformation of ribbon type, during in-pile cycling, 11: 9834
design, to facilitate reprocessing by the Hermex Process, 11: 12366
design and development, 11: 13806(R)
design and fabrication, 11: 9113(J), 13189(R)
design and testing, 11: 11745(R)
design-economics analyses of EBWR, 11: 11747(R)
design features of, for Scottish power plant, 11: 4702(J)
design for continuous processing, 11: 4698
design for ETR, 11: 5611(J)
design for enriched U, graphite moderated Belgian BR-I reactor, 11: 6906
design for He-cooled, D_2O-moderated, natural U power plant, 11: 6075
design for maximum heat transfer, 11: 5036(J)
design of, containing B, 11: 7807
design of, thermal, mechanical, and hydraulic consideration, 11: 12242
design of high-power, for SRE, 11: 8688(R)
design of KAPL Plutonium Power Breeder Reactor, 11: 12556
design of parallel rod, triangular pitch, 11: 2734
design of pin and plate assemblies for OMRE, 11: 12895(R)
design of pin- and plate-type, for APDA reactor, 11: 10276
design of pin-type, 11: 11791
design of PWR, 11: 9109(R), 10988(R)
design of tube-type, for the MTR, 11: 10975
design of water-type for Na-cooled reactors, 11: 11549(P)
design of wire cloth as fuel-bearing medium, 11: 13169
design requirements and heat transfer characteristics, 11: 4109(J)
development and design of MTR, 11: 7786
development and production at BNL, 11: 3063
development of B–Cu systems and Cd–In–Ag alloys, 11: 12752
development programs at Hanford, 11: 11408(R)
dimensional specifications for MTR, 11: 2507
dimensional stability, 11: 13162
dimensional stability, effects of plastic deformation on, 11: 13930
dimensional stability spacers in, heat transfer coefficients near, 11: 14013
dimensional tolerances, 11: 13861
dimensions of PRPR, calculations, 11: 12885
dissolution, 11: 7509(R), 11567(R), 13682(R)
dissolution, ultrasonic effects, 11: 5889(R)

Reactor fuel elements (cont'd)

dissolution in a fluoride melt and direct fluorination for production of UF_6, 11: 4392

dissolution in Fluoride Volatility Process, 11: 11968

dissolution in fused fluoride baths, 11: 11052

dissolution in HNO_3, 11: 3367(J)

dissolution methods for conversion to HNO_3 acid soluble form, 11: 1006(J)

dissolution of Al-U alloy to a dibasic $Al(NO_3)_3$ dissolver product, 11: 10470

dissolution of EBR in nitric acid, 11: 7856

dissolution of Zr–U in H_2SO_4–HF system, 11: 11969

dissolver solutions for MTR, particle settling rates in, 11: 11624

double grid, calculation of multiplication factors, 11: 12904(J)

drag coefficients of various shaped, 11: 8024

economic aspects of natural vs. enriched U for, 11: 11445(J)

economic aspects of sodium graphite power, 11: 9464

eddy-current inspection of clad Mo–U alloy, 11: 7728

eddy-current testing methods, 11: 12057

eddy-current testing of zircaloy tubing for fuel element cladding, 11: 1054

end closure development, 11: 10985

end closure development for stainless steel–uranium oxide dispersion type, 11: 13800

enrichment cost of power increments gained by flattening and by close rod spacing, 11: 10281

extrusion-clad Ni-plated, interdiffusion of Ni and Al in, 11: 5879

extrusion of dispersion-type, techniques for, 11: 7328(R)

fabrication, cost analysis, 11: 6890

fabrication and chemical re-processing, costs, 11: 2775(J)

fabrication and inspection of PWR, 11: 6909(R)

fabrication and physical properties, 11: 683(J)

fabrication and testing of tubular, 11: 3576(J)

fabrication by high temperature flame techniques, 11: 6713

fabrication for Calder Hall Reactors, 11: 9118(J)

fabrication for PWR, 11: 8718(R), 9109(R), 11806(R), 11808(R)

fabrication of Al-clad U plates with Ni coating, 11: 13777

fabrication of Al–Pu, 11: 7652

fabrication of Brookhaven, 11: 2633(R)

fabrication of defective, as standard for calibration of nondestructive test equipment, 11: 13314

fabrication of EBWR, and processing of spent, 11: 7864

fabrication of jacketed U helices, 11: 8917

fabrication of Mg–U dispersion by hot pressing, 11: 12477

fabrication of MTR Mockup plate-type assemblies, 11: 13597(R)

fabrication of plate assemblies, warpage during, 11: 13103

fabrication of "radiator" type, 11: 11710(R)

fabrication of Teflon, for critical experiments, 11: 3062

fabrication of Sn–U–Zr, 11: 12522

fabrication techniques for EBR, 11: 9779

failure, effect of pressure and heat on, 11: 2445

failure, uranium and uranium oxide distribution following, 11: 12564

failure in reactors, 11: 12236

failure in reactors, activity transport from, 11: 10878

failure in reactors, detection, 11: 9467

Reactor fuel elements (cont'd)

fission counting of irradiated, and determination of U^{235} in, 11: 13106

fission gas pressures in PWR, 11: 11812

fission product activities from corrosion of, 11: 8717(R)

flow studies on Cobra subassembly, dye mixing tests, 11: 4101

fuel recovery from U–Zr alloy, 11: 9638

handling and cycle analysis of, in the APDA reactor, 11: 10276

handling apparatus, for loading and unloading gas cooled reactors, 11: 11528(P)

handling equipment, 11: 7846(R)

handling equipment for EBWR, 11: 11748(R)

handling of Calder Hall, and ruptured slug detection, 11: 3084(J)

handling of MTR Mockup, 11: 8705(R)

handling system for, functional requirements, 11: 13118

heat transfer, boiling during power surges, 11: 11426

heat transfer analysis, 11: 13868(R)

heat transfer and fluid flow for configurations, 11: 10515

heat transfer by boiling, 11: 6705(R)

heat transfer characteristics, 11: 13715

heat transfer coefficients near spacers in, 11: 14013

heat transfer conditions in, 11: 6099(J)

heat transfer from, method of measuring, 11: 4686

heavy-water-cooled, p- and f-factors in Al-clad, 11: 6903

hot channel factor for parallel rod, 11: 6332

hot channel factor re-evaluation for APPR-1, 11: 7323

hydraulic testing of MTR, 11: 1276(R), 2694, 9052(R)

hydraulic testing of ORR, 11: 10935

hydraulic testing SRE, 11: 8688(R)

hydrodynamic characteristics, 11: 12888(R)

hydrodynamic characteristics of parallel rod, 11: 2734, 2736

in-pile testing of U–2 wt. % Zr alloy in the X-2 loop, 11: 12882

inspection for burnup, design of instrument, 11: 10663(J)

irradiated, shielding requirements for handling and shipping of APPR, 11: 2195

for liquid metal cooled reactors, container for wafer-type, 11: 11550(P)

irradiation facility for, 11: 5019

loading, temperature monitoring, designs, and isotopic composition of SRE, 11: 13969(R)

loading and unloading device for, 11: 11525(P)

manipulator for handling in the viewing basin, 11: 2572

mechanical stabilization, 11: 7628

mechanical testing SAR unit cells, 11: 10956

metallography of Geneva, 11: 3428

neutron flux distribution in Zephyr, 11: 635

neutron temperature increase in rod, sphere, and slab, calculations, 11: 9768

nondestructive testing, 11: 8687(R), 11714

melting, pressure rise accompanying, and γ intensity and heating values of spent, 11: 8677(R)

nondestructive testing for fuel placement, 11: 13950

nondestructive testing for SGR, 11: 8686(R)

nondestructive testing for U^{235} content by γ monitoring, 11: 2608

nondestructive testing of Hanford, mechanization of, 11: 11670

Reactor fuel elements (cont'd)
plutonium recovery, 11: 8868
preparation from U^{233}, U^{235}, or Pu^{239} incorporated in glass fibers, 11: 10754(J)
preparation from U_3O_8 dispersed in Teflon, 11: 10753(J)
pressure buildup from fission gases, 11: 8664
pressure drop tests on parallel rod subassemblies, 11: 6330, 6331
problems and possibilities of liquid, 11: 6081
processing, 11: 7407(R)
processing by multi-purpose centrally located solvent extraction plant, chemical principles, 11: 1006(J)
processing EBR, by solvent extraction, 11: 7825
processing of irradiated, by fluoride volatility, 11: 8882(J)
processing plant design for U and Pu, 11: 5817
processing plant for KAPL Plutonium Power Breeder, 11: 13005
pyrochemical processing, 11: 7547
radiation effects, 11: 6713, 13564(R)
radiation effects and cooling requirements of EBR-II, 11: 11747(R)
radiation effects on SIR fuel materials, 11: 13724
radiation effects on ZPR-1, 11: 9870
radiation emission in canal storage, effect of defective, 11: 14032
radiographic inspection techniques, 11: 12057
radioinduced heating after operation, 11: 12536
reactivity calculations for solid, effects of various coolants, 11: 2116(R)
reactivity changes and reactivity lifetimes of thermal, 11: 682(J)
refining of spent Th, 11: 4480(J)
reprocessing at JENER, 11: 11983(J)
reprocessing by solvent extraction, radiation damage to process reagents, 11: 3744(J)
rupture detection for gas-cooled reactors, 11: 5037(J)
rupture detection system evaluation, 11: 10739
rupture in uncontrolled reactors, 11: 11792
rupture tests involving more than two metal types, statistical analysis, 11: 13921
self-shielding in slabs, variational method of calculation, 11: 12233
self-shielding measurements on slabs, 11: 9105
silicon carbides used in, powder metallurgy of, 11: 8464
shipping in rubber-lined wooden boxes, criticality studies of, 11: 13830
solvent extraction processing of, effect of radiation and inert alloy metals, 11: 1006(J)
sonic inspection and frost tests, 11: 5902(J)
statistical analysis of non-destructive assay data for MTR, 11: 8676
standardization of handling devices, 11: 7717
storage, disassembly, desheathing, and dissolving, cost analysis, 11: 6890
storage and shipping of U^{233}, 11: 14042
storage basins for, corrosion, 11: 270
storage in vaults, safety, 11: 13835
storage of irradiated, 11: 1026
storage of irradiated, economic aspects, 11: 9132(J)
temperature and thermal stresses in Be of fuel element core rod, 11: 12562
temperature distribution in thick, effect of non-uniform neutron flux distribution on, 11: 6892
temperature measurement, methods, 11: 10149
Reactor fuel elements (cont'd)
test assemblies for failures, 11: 10984
testing, for sodium graphite reactors, 11: 9478(R)
testing, in-pile burnout, 11: 12606
testing, nondestructive methods, 11: 13512(J)
testing, pre-irradiation, 11: 11751
testing of defected Zircaloy-2-clad U–Nb and U–Nb–Zr, 11: 14002
tests for PWA-welded bundles, 11: 9878
tests of irradiated, out-of-pile dynamic loop, 11: 10520
thermal analysis by electric analogue equipment, 11: 10923(R)
thermal analysis with electric analogue, 11: 13868(R)
thermal bowing effects on temperature coefficients, 11: 5585
thermal effects on, laboratory simulation of, 11: 13727
thermal stress calculations for cylindrical, 11: 3072
thermal stresses, mathematical analysis, 11: 10798
thermocouple in-pile calibration, 11: 10959
ultrasonic bond testing of Hanford, 11: 11783
ultrasonic dissolution, 11: 8943(R)
ultrasonic method for bond testing, 11: 5583
ultrasonic welding used in fabrication of, 11: 8677(R)
uranium recovery by dissolution in HNO_3 and NaOH, 11: 2819(J)
use of spent MTR, as gamma sources, 11: 6105(J), 10595(J)
Van de Graaff facility for studying deposition of corrosion products on, 11: 4900
vibrations in LITR assembly, 11: 7854
volatilization of fission products, 11: 12487
welding, prevention of porosity in, 11: 10902
zirconium-clad U, extrusion, 11: 8516(R)
Reactor fuel elements (ceramic)
corrosion by water, 11: 13779(R)
design of ThO_2–UO_2 pellet, 11: 11748(R)
development for PWR, 11: 6909(R), 10737(R), 10988(R)
development of UO_2, 11: 11490
development programs at Hanford, 11: 11408(R)
dissolution of ThO_2–U_3O_8, 11: 9718
fabrication, 11: 10507(J)
fabrication and properties of ThO_2–UO_2, for high temperatures, 11: 5704(J)
fabrication of, for PWR, 11: 9714
fabrication of UO_2, 11: 7898
fabrication techniques, 11: 9109(R), 11720
fission products from, 11: 6909(R)
interfacial reactions of UO_2 (Zr clad) sandwich-type, 11: 11914
irradiation behavior of Al–UC_2, 11: 3071
irradiation behavior of U_3O_8–Al compacts, 11: 3070
melting of UO_2, heat flux necessary to start, 11: 13189(R)
properties of UO_2–SiO_2 systems as, 11: 13737
radiation effects, 11: 10988(R)
radiation effects on swage compacted UO_2, 11: 12000(R)
use of U–Si epsilon phase, 11: 7684
Reactor fuel elements (impregnated)
(See also Beryllium oxides (impregnated); Graphite (impregnated).)

Reactor fuel elements (impregnated) (cont'd)
diffusion of fission product from, 11: 8756
fabrication for Low Power Research Reactor, 11: 13967
heat transfer from, effects of particle size, 11: 9840
radiation damage, 11: 8547(R)
uranium recovery from, using BrF_3, 11: 9637
Reactor fuel pins
corrosion, 11: 8707(R)
design studies of operational stresses, 11: 13943
fabrication of EBR, 11: 8462(R)
heat transfer and coolant flow calculations for fast-reactor, 11: 13942
stress and strain, effects of cold work and irradiation, 11: 13799
structural behavior, nuclear catastrophe effect, 11: 13799
temperatures and stresses in thoria-urania, 11: 4664(R)
thermal stress analysis, 11: 13943
Reactor fuel plates
boiling, heat transfer, and stress in, effects of fins and spacers on, 11: 10982
brazing of Al spacing fins to Al-clad, 11: 11694
buckling under thermal stresses, 11: 7851
cladding, fabrication, and testing methods, 11: 7625
cladding of U, with Zircaloy-II, 11: 11744(R)
cladding thickness measurement, design of eddy current device for, 11: 4538
corrosion by steam and air, 11: 10923(R)
corrosion during cleaning with HNO_3–HF, 11: 13340
corrosion of B–Al cladding for ETR, 11: 1276(R)
corrosion of EBWR by high-temperature H_2O, 11: 11748(R)
deflection due to pressure differentials, 11: 5013
deformation of MTR, 11: 4685(R)
density measurements for U_3O_8 distribution in Al–U_3O_8, 11: 13901
design and fabrication, 11: 9862
design and testing in MTR, 11: 13145
dissolution of APPR, in aqua-regia, 11: 11054
dissolution of Zr-clad U, 11: 11643
fabrication, 11: 7630(R), 10887(R), 13868(R)
fabrication and corrosion tests, 11: 11746(R)
fabrication and properties of UO_2–stainless steel, 11: 13077
fabrication and testing, 11: 7629(R)
fabrication by centrifugal casting, 11: 7641
fabrication for EBWR, 11: 11689(R)
fabrication for PWR, 11: 8716(R)
fabrication of Al-clad U, 11: 8466
fabrication of Al–U_3O_8 compacts, 11: 13897
fabrication of natural-U clad, 11: 12470
fabrication of Pu and Pu–U by centrifugal casting, developmental studies, 11: 8505
fabrication of seed clusters for PWR, 11: 5030
fabrication of UO_2–Al–Al clad, for the Geneva Reactor, 11: 13914
fabrication of ZPR-III, 11: 7725
fabrication of Zircaloy clad, 11: 8462(R)
fabrication of Zr-clad U, 11: 7623
fabrication problems for APPR, 11: 12548
Reactor fuel plates (cont'd)
gamma ray scanning, detection of U^{235} burnout by, 11: 12515
gap, determination of optimum, 11: 10728
heat transfer and thermal conductivity of laminated, 11: 13868(R)
hydrodynamic characteristics of MTR and ETR, 11: 13430(R)
imperfections in APPR, 11: 10720
irradiation behavior of Al–UC_2, 11: 3071
manufacture for Experimental Boiling Water Reactor, 11: 12873
measurement of Al coatings on U plates, 11: 13049
melting, gaseous fission products from, 11: 12623
melting, volatilization of fission products by, 11: 11970
metallographic analysis, 11: 13901
neutron flux distribution, determination of, 11: 12242
nondestructive measurement of Al and Ni coating thickness on, 11: 8465
potentiometric titration analysis, 11: 13901
radiation damage in APPR, 11: 12540
radiation effects, 11: 11106
radiation effects on a dispersion of U_3O_8 in Al, 11: 11468
radiation effects on Al-clad Th–U^{235} alloy, 11: 9891
radioautographic, radiographic, and ultrasonic inspection, 11: 4464(R)
specifications, fabrication, and inspection of stainless steel-UO_2 (stainless steel clad), 11: 11766
stress analyses for EBWR, 11: 13869(R)
temperature distribution, equation, 11: 2432
temperature distribution in parallel, with nonuniform heating, 11: 13880
temperature distribution in Supercritical Water Reactor, 11: 13186
testing of EBWR, 11: 11748(R)
thermal stress analysis, 11: 12242
thermal stresses in clad, flat, 11: 6923(J)
transformation and nonbond ultrasonic tester for, design and performance, 11: 7698
transient heat conduction in unclad, 11: 9810
warpage during assembly fabrication, 11: 13103
Reactor fuel rods
assembly improvements, 11: 7397(P)
breeder blanket, temperature distribution in, 11: 13782(R)
cladding for high-temperature service, 11: 12524
cooling in natural uranium reactors, 11: 12602
corrosion failure, effect of stabilized U filament size in multifil billets, 11: 13757
creep and rupture of water-logged PWR, 11: 14007
design and analysis of KAPL Intermediate Power Breeder, 11: 8680
design for heavy-water-cooled reactors, 11: 8252(P)
design of Mg–U alloy rods, 11: 9742
design of PWR, 11: 12608(R)
dimensional stability, heat transfer characteristics, and fabrication of Al-jacketed U, 11: 9859
dimensional stability, mathematical analysis, 11: 11777
end closures for PWR, radiographic inspection techniques, 11: 1063
end sealing by welding, 11: 12523
extrusion cladding, 11: 13809
extrusion of Mo–U alloy steel coated, Zircaloy-2 clad, 11: 8535
extrusion of Zircaloy-clad Mo–U, 11: 8537, 13811, 13814

Reactor fuel rods (cont'd)
extrusion of Zircaloy-2 clad Si–U, 11: 13813
extrusion of Zircaloy-2 clad U–Zr, 11: 13810
fabrication and pressure changes of Experimental Breeder Reactor, 11: 11742(R)
fabricated from thin U plates clad with Zr, design, 11: 13965
fabrication, structural charges in, 11: 8534
fabrication at ORNL, 11: 8530
fabrication for in-pile testing, 11: 14008
fabrication for PWR, 11: 8716(R)
fabrication of U alloy (zircaloy clad), 11: 11717
fabrication of U–Mo, by drawing co-extruded round rods, 11: 8539
fabrication techniques, 11: 10987(R)
fabrication techniques and irradiation in MTR, 11: 11721
failure in reactors, 11: 9741
heat flux in, equations for, 11: 8541(R)
heat generation after removal from power reactors, 11: 12577
heat treatment of N.A.A. enriched, operating procedure for, 11: 10892
inspection, 11: 11749
inspection of PWR, 11: 9109(R)
maximum force of warped, against rigid constraint, 11: 2677
mockups for Experimental Breeder Reactor, and effects of thermal cycling on, 11: 13763(R)
neutron absorption of enriched in lattices, 11: 11753
neutron flux distribution in PWR, 11: 13189(R)
potentiometric testing of EBR, 11: 10921(R)
power levels, temperature considerations, 11: 7718(R)
pressure rise in water saturated, 11: 8720(R)
radiation damage, 11: 9741
radiation expansion, 11: 14005
radiographic inspection, modifications for PWR, 11: 10071
reactivity studies on NRX, 11: 5018
rolling Th, 11: 9731
sheath failure in, delayed-neutron monitors for detection, 11: 8097(J)
temperature and thermal stresses, relationship to physical properties, 11: 8663
temperature distribution in interior of, in stationary operation, 11: 6901
temperature effects on NaK level in CP-4, 11: 7718(R)
testing alignment changes from pressure drops, 11: 7841
testing of bent PWR, 11: 10983
thermal analysis of core eccentricity hot channel factors, 11: 10740
warping instability in long, 11: 7815
welding, 11: 10988(R)
welding failures, 11: 10963
welding methods for end capping, 11: 13780
welding of PWR, 11: 12608(R)
x-ray photometric analysis, for NaK level determination, 11: 7718(R)

Reactor fuel sheets
diffusibility, effect of fission products on, 11: 11712

Reactor fuel spheres
cladding with Zr, 11: 8717(R)

Reactor fuel spheres (cont'd)
fabrication, 11: 13868(R)
fabrication, investigation of methods for, 11: 7689
fabrication by powder metallurgy, 11: 12482
fabrication equipment, 11: 10923(R)
fabrication for PWR, 11: 8716(R)
fabrication of natural U- Zircaloy-2 clad, 11: 13812
fretting wear of Zircaloy-clad UO_2, 11: 3400
heat output capabilities of, 11: 14015
hydrodynamic properties, 11: 8545
neutron scattering, 11: 7842(R)
thermal stress analysis of Zr-clad, 11: 8482

Reactor fuel systems
cleaning procedures for HRT, 11: 8653
development of homogeneous, 11: 7861(R)
entrainment separator for HRT, efficiency, 11: 10941
gas separator of HRT, analysis for use as solids concentrator, 11: 9816
heating of HRT, procedure, 11: 8655
hydrostatic testing of HRT, 11: 8652
radiation from stator region of HRT circulating pump, 11: 11398
radiation level measurements of HRE components after 27-month storage, 11: 9098
soup dump line in HRE, oscillations in, 11: 2639
testing of HRT fuel charging system, 11: 9802

Reactor fuel tubes
design and power levels for Na-cooled reactors, 11: 7853
fabrication of Al-clad Th, 11: 12490(R)
formation of Fe–U eutectic in EBR, 11: 11747(R)
thermal stresses in cylindrical BeO and graphite, of Daniels Power Pile, 11: 8683

Reactor fuel wires
design and fabrication of twisted, 11: 9785
fabrication, 11: 13868(R)
fabrication by shrink-fit method, 11: 12499(R)
fabrication of U–Zr–Zr clad, 11: 12589
pressure drop tests on twisted, 11: 9785
uranium, fabrication, 11: 11829

Reactor fuels
(See also Reactor fuel alloys; Reactor slurries; Reactor solutions.)
buildup of heavy isotopes in neutron irradiated U, 11: 4213
burnup, economic aspects, 11: 3550
chemical processing principles, 11: 188(J), 193(J), 659(J), 683(J), 2136(J)
consumption and production for U^{238}–U^{233} mixtures, 11: 4215
development for rockets, 11: 9121(J)
disassembly for dissolution, 11: 7139(R)
dumping in HRT, pressure system for, 11: 2647
dumping of HRT, effect of heat, pressure, and radioactivity on, 11: 2674
economic aspects of fabricating and processing power, 11: 681(J)
electrolytic reduction process for U recovery, 11: 7968
enriched U, bibliography of, 11: 2226
fission product accumulation and poisoning, 11: 5018
fission product decontamination by hydrochlorination, 11: 13653(R)

Reactor fuels (cont'd)
fuel recovery bibliography, 11: 7140
high temperature processing, 11: 9835
long term radiation exposure, 11: 11002
mathematical analysis of fuel burnup and poison effects, 11: 9135(J)
non-aqueous processing, 11: 12402
physical and nuclear properties, 11: 8575
processing, 11: 7513(R), 13225(J)
processing and reprocessing methods, 11: 13517(J)
processing from ores to fabrication of elements, 11: 10387(J)
processing of, bibliography, 11: 7140
processing of homogeneous, comparison of batch and continuous, 11: 11769
processing plants, direct maintenance, practicality, 11: 194(J)
production, 11: 13516(J)
properties of liquid metal, 11: 7732(R)
properties of refractory U compounds for, 11: 812
purification by fractionating fusion, 11: 5702(P)
pyrochemical processing for fuel recovery and fission product decontamination, 11: 13680(R)
reprocessing, economic aspects, 11: 8875(J)
testing, modification of MTR loop for, 11: 13730
thermal and radiation stability of UO_2CO_3 solutions, 11: 2384
thermal expansion from 0 to 400°C, 11: 9743
uranium dioxide, chemical and physical properties, 11: 9901

Reactor fuels (fused salts)
activation analysis of ARE, for power level determination, 11: 13135
properties and processing of $NaCl-MgCl_2-UCl_4-PuCl_4$, 11: 10724
radiation effects, 11: 13836(R)
volumetric analysis for U^{3+} using methylene blue, 11: 12974

Reactor fuses
See Reactor control elements.

Reactor hazards
See Reactor safety.

Reactor materials
(See also Building materials; Reactor shielding.)
boiling burnout data for Ni, 11: 8580
chemical aspects of non-metallic, 11: 7334(J)
compatibility with Bi, 11: 2140(J)
corrosion, 11: 5832(J)
corrosion and wear, data for water-cooled reactors, 11: 12028
corrosion by biphenyl, 11: 2898
corrosion by boric acid, 11: 11806(R)
corrosion by high-temperature H_2O, 11: 2482, 2903(J), 2904(J), 8715(R), 11748(R), 12029(R), 12907(J), 13756
corrosion by liquid Bi-base metals, 11: 8444
corrosion by organic moderator coolants, 11: 4407(R)
corrosion by Santowax R (mixed polyphenyls), 11: 13321
corrosion by uranium oxide–H_3PO_4 solutions, 11: 1837
corrosion by UO_2SO_4 solutions, 11: 11803
corrosion by water, 11: 8717(R)
corrosion of core material, calculated deposited crud activity in primary system, 11: 11433

Reactor materials (cont'd)
corrosion of PWR, 11: 8716(R)
corrosive effects of coolants on, 11: 3783(R), 6700(R)
crystal defects, theory, 11: 14026
dissolution in fused fluoride baths, 11: 11052
explosive reactions with H_2O at high temperatures, 11: 2511
evaluation tests, 11: 2715
factors in selecting, 11: 13129
gamma heating in BSR, comparison of calculated and measured, 11: 4675
glossary, 11: 10926
in-pile burnout test proposal at MTR, 11: 10993
irradiation capsule for, 11: 13723
neutron capture, 11: 590(J)
neutron cross sections, tables, 11: 594, 3523
oscillation method for evaluating, 11: 661(J)
oxidation behavior, 11: 13516(J)
physical and nuclear properties, 11: 8575
physical properties, 11: 379(J), 2715, 2775(J), 2878
properties of Al, Al–Mg, Zr, 347 stainless steel, and Zircaloy-2 as, 11: 11193
properties of ceramic, 11: 13081
properties of stainless steels, 11: 10889
radiation damage, theory, 11: 14026
radiation damage dosage, 11: 8186(J)
radiation effects, 11: 1276(R), 4898(J), 7887, 9890, 13763(R)
radiation effects in Los Alamos Fast Reactor, 11: 12570
radiation testing, 11: 13883(R)
reactivity effects, design of subcritical assembly for determining, 11: 13918
solid state reaction studies of, for control rods, 11: 13881
testing and properties, 11: 8679(R)
testing in reactors, device, 11: 3256(P)
thermal conductivity, 11: 13868(R)
thermal conductivity, apparatus for measurement, 11: 3875
wettability by Na and NaK, 11: 4464(R)

Reactor matrices
(See also Critical assemblies.)
analysis of depleted, natural, and enriched U, in D_2O, 11: 7845(R)
application of minimum loading conditions to enriched, 11: 10312(J)
buckling, 11: 11407(R)
buckling, effect on reactivity in the LTR, 11: 2116(R)
buckling and fast fission factor measurements in U–H_2O systems, 11: 13885(R)
buckling and neutron flux distribution, 11: 7843(R)
buckling and reactivity, 11: 7691(R)
buckling in U–D_2O, 11: 2139(J)
buckling measurements and calculations, 11: 5493(R)
buckling measurements on D_2O, effect of photoneutrons on, 11: 12508(R)
buckling measurements on 1%-enriched U rods in H_2O and uranyl nitrate solutions, 11: 1657
buckling in water, slightly enriched U, 11: 9983(R)
buckling of thermal neutrons in square U–D_2O, 11: 10972

Reactor matrices (cont'd)
computation of neutron escape probability, 11: 2686
convection heat transfer and friction correlations, 11: 654
critical dimensions for aqueous U^{235}, 11: 12632
critical loading in PPA, 11: 12566
critical loadings of right-cylinder Fe–H_2O, 11: 7328(R)
critical mass of Pu for cylindrical, 11: 13107
critical sizes and multiplication rates of spherical, surrounded by infinite reflectors, 11: 1637
critical studies, effect of absorbing membranes of Cd, B, and Au, 11: 9480
criticality constants for CVR, 11: 7709(R)
criticality measurements, 11: 7734(R)
criticality of, for the EBWR using D_2O coolant-moderator, 11: 6884
criticality studies and design of OMRE, 11: 6087(R)
criticality studies and neutron flux distribution in EBWR, 11: 11747(R)
criticality studies for various H–U^{235} slab and cylinder arrangements, 11: 12615
criticality studies of water-moderated slightly enriched U, 11: 12603
criticality studies on enriched U–D_2O systems, 11: 9838
design, composition and reactivity, 11: 13157
design, for pressurized water reactors, 11: 10987(R)
design and construction of cores, 11: 9113(J)
design for APDA reactor, 11: 10276
design for better cooling of graphite, 11: 7030(P)
design for more uniform K factor, 11: 5106(P)
design of, for the EBWR using D_2O coolant-moderator, 11: 6884
design of SRE, 11: 4095(R)
diffusion theory for ring of cylindrical rods, two-group, 11: 11393
disadvantage factors for Th and Th–U rods in graphite–uranium lattice, 11: 8174
enriched U-Zr, experiments in PWR facility, 11: 10738
enrichment cost of power increments gained by flattening and by close rod spacing, 11: 10281
exponential experiments on uranium rod lattices in graphite moderator, 11: 12508(R)
exponential experiments with slightly enriched U rods in H_2O and on D_2O–U, 11: 682(J)
exponential measurements, 11: 8116(R), 13968(R)
exponential measurements on slightly enriched U–H_2O, 11: 7710(R), 11752(R), 13884(R)
fast effect in U^{238} lattices, 11: 3568(J)
fast fission effect in close packed, 11: 14012
fast fission factor calculations for U–H_2O, 11: 9872
fast fission factor of natural U–D_2O, 11: 593
fission cross sections of Pu^{239} and U^{235} in U–H_2O, 11: 622(J)
fission neutron age in U–H_2O, 11: 8564
flow and temperature distribution with nonuniform heat generation and boiling, 11: 10059
flow friction behavior and thermal design data for cross rod, 11: 8892
flow studies on Cobra subassembly, dye mixing tests, 11: 4101
flux distribution in slabs and cylinders, Ensign code for computing, 11: 6802
flux in a rectangular cavity, calculation of, 11: 9874
flux ratios in repeating slab arrays, variational method of calculation, 11: 12233
Reactor matrices (cont'd)
heat transfer in water cooled, cylindrical rod, 11: 13048
hydraulic characteristic in MTR, effect of fuel element failure, 11: 2445
infinite multiplication factor, favorableness factor, and reactivity tests in LTR, 11: 1275(R)
loading for flat flux, 11: 10735
logarithmic energy width in resonance absorption region of, dependence of the resonance escape probability upon, 11: 1339(J)
material buckling vs. neutron multiplication factor in design, 11: 9474
mathematical analysis, 11: 13507
maximum wall temperature in APPR, effect of coolant flow on, 11: 13875
measurement of f, p, and ϵ for UO_2-fueled TRX lattices, 11: 11434
measurements on D_2O–U, 11: 7850(R)
mock-up of PWR, 11: 12608(R)
multiplication factor for natural U–H_2O, 11: 11739(R)
multiplication factor for water-metal, 11: 2676
neutron absorption in non-reflected natural U–D_2O, 11: 9842
neutron age in metal-water and hydrocarbon-water, 11: 10914
neutron densities in natural U–D_2O, 11: 10970
neutron diffusion, two-dimensional multigroup equations for, 11: 2698
neutron diffusion in, variational method and associated approximate methods for treating, 11: 13937
neutron diffusion lengths in, 11: 12594
neutron distributions in enriched, containing U^{234}, U^{238}, Fe, and Al, 11: 11744(R)
neutron energy spectra in infinite, 11: 9431
neutron flux distribution, 11: 7847(R), 10986(R), 11809, 13968(R)
neutron flux distribution, calculations, 11: 9805, 13940
neutron flux distribution, corrected equation for, 11: 2720
neutron flux distribution in, of cylindrical rods and tubes, 11: 10716
neutron flux distribution in infinite annular cylinders, two-group iteration method for calculating, 11: 6071
neutron flux distribution in spherical, Beehive and Hornet codes for calculating, 11: 8177
neutron flux distribution in spiked, 11: 6532, 7328(R)
neutron flux distribution in SRE, 11: 10736(R)
neutron flux distribution in U–D_2O, plots of, 11: 8694
neutron flux distribution measurements, 11: 10334
neutron flux distributions and buckling in SRE, 11: 13969(R)
neutron flux measurements in seven-rod D_2O moderated, 11: 7846(R)
neutron resonance escape probability in slabs, 11: 6007(J)
neutron spectra in hydrogen moderated, code for calculating, 11: 6463
neutron spectrum characterization in H_2O–U, 11: 5598
parameter survey for depleted and natural uranium lattices, 11: 10976
plutonium Pu^{239} breeding ratio in U–H_2O, 11: 678(J)
power peaking in rod channels, 11: 10299
pressure drops in EBR-II, 11: 11746(R)
reactivity calculations for graphite–U, 11: 4071
reactivity measurement facility, design, 11: 2679
research on the characteristics of, at British, Canadian, and U. S. installations, 11: 7326
resonance capture in U–H_2O, 11: 6094
resonance escape in graphite, Monte Carlo calculations, 11: 9772(R)

Reactor matrices (cont'd)
resonance escape in Th–U–H_2O, 11: 13514(J)
resonance escape probabilities for graphite–U, and thermal utilization, 11: 4013(R)
resonance escape probability in slightly enriched U–H_2O and UO_2–H_2O, 11: 11348
resonance escape probability of, calculations, 11: 5493(R)
resonance integrals for natural U–H_2O, –D_2O, –graphite, 11: 11348
screen, heat transfer and friction power loss, 11: 230
self-shielding measurements on slabs, 11: 9105
slab geometry, thermal and resonance utilization calculation methods for, 11: 13827
stainless steel–water cores, analysis, 11: 9104
stress analysis of hexagonal, 11: 13936
temperature coefficient of LTR, 11: 2116(R)
temperature distribution effect of variable graphite conductivity and of gas layers on, 11: 2291
theory of U–H_2O, 11: 682(J)
thermal utilization, resonance escape probability, and fission effect in UO_2-fueled, 11: 5594
thermal utilization and determinations for fuel rods in light H_2O and H_3BO_3–H_2O systems, 11: 8715(R)
thermal utilization in slab lattices, variational and successive collision results, 11: 10958
thermal utilization in U–H_2O, 11: 7737
thermal utilization of 0.387-in. diam. 1.15% enriched U rods in H_2O, 11: 7736
thermal utilization using slightly enriched rods, 11: 11753
two-group three-region cylindrical approximation calculations, 11: 2693
water ejection from vertical channels, 11: 8178
water-moderated, calculation of fast effect, 11: 2637

Reactor mockups
See Critical assemblies; Materials Testing Reactor Mockup.

Reactor moderators
bibliographies on organic, 11: 4655
canning of graphite, by Zr, 11: 8686(R), 8687(R)
canning of SRE, alignment jig for, 11: 13969(R)
decomposition of water in EBWR, 11: 11746(R)
design and fabrication of SGR, 11: 7848(R)
gamma reactions in D_2O, 11: 12508(R)
heat transfer and corrosive effects of organic compounds, 11: 2889
in-pile testing of various polyphenyls as, 11: 6568(J)
metal hydrides as, 11: 1703(J)
neutron age in hydrocarbon, 11: 8687(R)
neutron flux distribution, 11: 7691(R)
neutron slowing down area in bismuth–graphite, 11: 4608
neutron thermalization and slow neutron transport, 11: 1265
neutron velocity spectrum in heavy, 11: 8110(J)
organic, for critical assemblies, 11: 2118
parameter survey for depleted and natural uranium lattices, 11: 10976
physical and nuclear properties, 11: 8575
properties of Na and terphenyl as, 11: 8686(R)
reactivity coefficients of hydrogenous compounds, method of measurement, 11: 13357

Reactor moderators (cont'd)
thermal analysis, 11: 8688(R)
thermal neutron diffusion approximation, 11: 6910
use of organic compounds as, 11: 12905(J)

Reactor multiplication factor
See Multiplication factor.

Reactor oscillators
calibration, 11: 11740(R)
construction for measurement of neutron cross sections in GLEEP, 11: 3543
design for fast reactors, 11: 13488
materials testing using, 11: 590(J)
measurement techniques, 11: 13497
power coefficient measurements with, 11: 13944

Reactor poison columns
See Reactor control rods.

Reactor reflectors
chemical explosions in HRE, 11: 7754
cooling in MTR, design of passages for, 11: 639
cooling requirements of MTR Mockup Be, 11: 13597(R)
corrosion resistance, 11: 11801(R)
critical size and neutron distribution of reflected chain reactors, 11: 1656
design and fabrication of SGR, 11: 7848(R)
design of MTR pebble system, 11: 638
effect on critical dimensions of cylindrical reactors, 11: 3567(J)
fabrication of MTR Mockup Be, 11: 13597(R)
heat generation in, method of calculating, 11: 4662
neutron flux density in, 11: 12185(J)
nuclear properties of thin Be and BeO, 11: 5027
placement in reactor tank for smaller critical mass, 11: 11536(P)
radiation damage to graphite in, 11: 5569
reactivity effect of air tank against one face of BSR, 11: 5591
support structures for MTR, 11: 4078

Reactor safety
(See also Criticality studies; Reactor control elements; Reactor control rods; Reactor control systems.)
analysis of metal-water reactions, 11: 12323
of APDA fast breeder power plant, 11: 6887
of Argonaut Reactor, summary, 11: 4072
bibliography of unclassified AEC reports, 11: 5593
biological hazards from radiation of K-23 and K-49 homogeneous reactors, 11: 2239
blast effects on one-quarter scale model of AFNETR, 11: 6889
calculations for Materials Testing Reactor operated at 40 MW, 11: 12889
calculations of optimum containment design of nuclear reactor vessels, 11: 11171(R)
chemical explosions in HRE core tank, 11: 7752
chemical explosions in HRE reflector tank, 11: 7754
constant speed straight line source for testing reactor period safety circuits, 11: 2733
control of core and blanket pressures during HRT dump test, 11: 9818
control system designs for more reliable, 11: 9134(J)

Reactor safety (cont'd)
criticality experiments for Brookhaven medical reactor, 11: 9790
design evaluation of BER regarding internal explosions, 11: 5004
development for SRE, 11: 13969(R)
device for injecting Cd or B balls, 11: 5105(P)
dump tank designs for HRT, 11: 2652
evaluation of, for homogeneous reactors, 11: 2661
evaluation of hazards to the environs, 11: 6209(R)
evaluation of Na cooled graphite-moderated reactors, 11: 7849
facilities for Experimental Breeder Reactor, 11: 11742(R)
for fast-breeder power plants, 11: 4110(J)
feasibility of chemical warning systems for reactor incidents, 11: 4084
fuses, development, 11: 11794
Hanford effluent discharge, sampling, 11: 11666
hazards as a function of power level, 11: 8188(J)
hazards associated with the WBNS Reactor, 11: 2722
hazards estimations for ORNL Research Reactor, 11: 9867
hazards evaluation of the Michigan Research Reactor, 11: 2630
hazards from normal marine accidents to nuclear powered merchant ships, 11: 5571
hazards summary, 11: 4094
hazards summary for Battelle Research Reactor, 11: 4076
heat transfer, calculated surface temperatures for nuclear systems and analysis of uncertainties, 11: 11412
for industry, 11: 13225(J)
kinetics of a temperature flash and associated problems, 11: 7324
low probability, high hazard accidents to APDA Reactor, 11: 6089
meteorological factors, 11: 2635
NRU Reactor control system, 11: 9100
power excursions in critical assemblies, self-shutdown features associated with, 11: 5031
power plant problems, 11: 13516(J)
pressure, fragment velocities, and core reactivity during explosion of pressure vessels, 11: 3074
proposed research program of scaled studies, 11: 6534
protection against biological hazards from fission products, 11: 11558
provision for, at Michigan Research Reactor, 11: 8173
radiation hazard of components after shut down for disassembly of APPR, 11: 2100
radiation hazards of nuclear-powered merchant ships, 11: 6616(J)
reactivity equivalents of safety and control rods, determination, 11: 4103(J)
in reactor development programs of AEC, 11: 4220(J)
research on poison containing fuses, 11: 9844(R)
research program of NAA, 11: 11424(R)
research programs, 11: 5025(R)
round table discussion, 11: 2775(J)
siting problems and hazards to public, 11: 3548
studies for Homogeneous Reactor Experiment, 11: 13981
supercriticality, symposium on, 11: 12590
temperature coefficients of reactivity and, 11: 7806
temperature effects of fission of U^{235}, 11: 8758
testing of BF_3 fuzes, 11: 8692
theory, 11: 2132(J)
time required for primary system blowdown, 11: 2097
Reactor safety (cont'd)
transient behavior of prototype fuse in simulated reactor excursions,
transient behavior of sub-cooled, water-moderated reactors, 11: 6101(J)
Reactor safety experiments
(See also Boiling reactors.)
constants for a SPERT-III core, two and three group, 11: 10731
criticality studies for SPERT-III, 11: 1276(R), 4685(R), 10730, 13430(R), 13492
design, engineering description of SPERT-I, 11: 11411
design objectives for SPERT-III, 11: 10752(J)
fuel elements for SPERT-I Core B, 11: 13430(R)
instabilities in SPERT-I, 11: 650, 3573(J)
instrumentation of SPERT-I, 11: 9102
kinetic behavior experiments in KEWB, 11: 6088
meeting notes on SPERT-III, 11: 8681
nuclear calculations for SPERT-III Zr core, 11: 13143
reactivity behavior during SPERT-I transients, 11: 10729
reactivity divergence in SPERT-I, 11: 650
reactivity effect of water annuli on large void spaces in SPERT-I reactor core, 11: 10732
Spert-III reactors facility design, 11: 10285
stability of SPERT-I, 11: 12890
transient behavior of sub-cooled reactors, measurements in SPERT, 11: 6101(J)
transients of KEWB facility, 11: 5026(R)
Reactor shield ducts
See Reactor shield voids.
Reactor shield voids
airborne activity from, between SAR pressure vessel and primary shield tank, 11: 13931
in Brookhaven Reactor, neutron transmission in, 11: 7734(R)
gamma radiation leakage through, calculation and application to HRT, 11: 5015
gamma radiation levels at HRT access holes, 11: 4679
gamma streaming through cylindrical, in water, 11: 13884(R)
leakage enhancement by, 11: 13216
neutron and γ transmission, 11: 13885(R)
neutron attenuation through cylindrical, 11: 9046
neutron flux distribution calculation for cylindrical air gaps, 11: 9049(J)
neutron flux distribution in thermal column containing, 11: 8691(R)
neutron leakage, 11: 10962
neutron leakage calculations, 11: 13217
neutron streaming in, optical model of, 11: 4753
neutron transmission by straight cylindrical, 11: 5056, 5490
neutron transmission in straight annular, in BEPO, 11: 8176
radiation leakage from, suggested experiments on, 11: 7367
weight penalty for, 11: 13213
Reactor shielding
(See also Shielding.)
activity in shielding rings in APPR-1 after shutdown, 11: 2101
barite concretes for, 11: 2766
biological, construction, 11: 3213
biological for HPR (K), construction techniques and equipment, 11: 2765

Reactor shielding (cont'd)
bismuth, for homogeneous reactors, 11: 4772(P)
compression tests on concrete, 11: 11747(R)
concrete aggregates, use of limonite in, 11: 8472
cooling by hydrocarbons, 11: 8687(R)
corrosion of Pb and steel by borated solutions, 11: 13889
corrosive effects of water at 85 to 95°F on, 11: 1864
cracking of SIR Mark A rotating plug shield can welds, 11: 2705
design, 11: 2710, 4183(J)
design, materials, and theory, 11: 2131(J)
design calculations for NRU Reactor, handbook, 11: 6893
design for ETR, 11: 5611(J), 5612(J)
design for mobile, 11: 14036
design modifications for Brookhaven Reactor, 11: 2714
design of biological shield for HRE, 11: 11823
design of EBR, radiation measurements relating to, 11: 9782
design of EBWR, 11: 636, 11748(R)
design of OMRE, 11: 6087(R)
design practices for steel reinforcing and expansion joints in concrete, 11: 9702
distribution of γ absorbers in spherical, 11: 9893
gamma and neutron attenuation, 11: 11821
gamma dose rates at SRE instrument tubes, 11: 4095(R)
gamma dose rates behind Pb shadow shields in water, 11: 6161
gamma-induced heating, 11: 9894
gamma radiation from EBR shield, 11: 10923(R)
gas formation in cans of B_4C, 11: 11004
group theory calculations for SRE, 11: 11425
heat generation and temperature distribution in HRT, 11: 2665, 8607
heat sources in typical, 11: 6573
iron concrete aggregate compared with ordinary concrete, 11: 13219
mathematical analysis, 11: 8230
multigroup diffusion theory, 11: 7846(R)
neutron absorption, 11: 8748
neutron attenuation, 11: 13564(R)
neutron attenuation in iron containing, 11: 4007
neutron attenuation theory, 11: 2768
neutron fluxes and heat generation in MTR, 11: 2638
performance of EBWR, 11: 4664(R)
pressure rises in HRT, due to reactor and replacement heat exchanger rupture, 11: 6526
radiation absorption and scattering by random aggregates of pebbles and applications to, 11: 12628
radioinduced heating, 11: 12581
radioinduced heating of concrete, 11: 9172
shielding properties of limonite and ordinary concretes, 11: 9173(J)
stress and temperature distribution in cylindrical concrete, 11: 2763
temperature distribution, theory, 11: 9172
temperature distribution in, mathematical analysis, 11: 7890
temperature gradients through biological, analog study, 11: 13215
temperature profile through SRE, 11: 13969(R)
theory, 11: 10968
theory of minimum weight, 11: 4180

Reactor shielding (cont'd)
thermal, design for HRT, 11: 7799
thermal-neutron curtains, effectiveness in reducing reactivity change, 11: 1669(J)
use of concrete as, 11: 12942

Reactor simulators
(See also Computers.)
analog computer usefulness as, 11: 6810(J)
analog programming of reactor model, 11: 13110
analysis of Shippingport PWR plant performance, 11: 13993
code for IBM-704 for thermal transients, 11: 9391
coding, equivalent cross sections for, 11: 13940
coding a Monte Carlo study of neutron penetrations through finite water slabs, 11: 11436
coding flux peaking in homogeneous, 11: 11402
coding for burnout, 11: 11418
coding for IBM-704, one dimensional few-group depletion, 11: 10640
coding specifications of Program George, 11: 10162
coding steady-state two-group equation for slab geometry with fast and thermal fission for IBM 650, 11: 10634
computations for HRE-3 design, 11: 11315
design, 11: 6905
design and development, 11: 13982(R)
design and mathematical analysis, 11: 662(J)
design and theory for group theory solutions, 11: 2593
design for teaching purposes, 11: 13517(J)
design proposal, 11: 5568
digital techniques applied to control systems, 11: 10165
electronic, for GEC Simon-Carves Atomic Energy Group, 11: 6543(J)
off-center control rod flux and power distribution formulation for digital computers, 11: 10163
operating instructions for a modification of the Eyewash program, 11: 9385
principles and development of analog computer, 11: 664(J)
programming by resistance-network analog method, 11: 12260(J)
programming of off-center control rod analytic two-energy group method, 11: 12874
programming two-energy-group analysis for a cylindrical reactor core with a ring of N control rods, 11: 10164
programming two group diffusion equations of cylindrical, 11: 9384
PWR trainer, description, 11: 6811(J)
start-up problems computed by, 11: 6911(J)
transient behavior of APDA Reactor studied by, 11: 2103

Reactor slurries
(See also Reactor fuel alloys; Reactor fuels; Reactor solutions.)
circulation systems, 11: 7770
composition for boiling homogeneous power breeder reactor, 11: 13906
corrosive effects, 11: 13698(R)
corrosive effects on stainless steel, Ti, and Zr, 11: 9722
costs of D_2O-UO_3 and H_2O-UO_3, 11: 8589
critical behavior of, on settling, 11: 13894
decontamination, 11: 13675(R)
density vs. temperature and concentration, 11: 2878

Reactor slurries (cont'd)
development, 11: 7857(R)
engineering properties, 11: 10292
filtration, water removal by, 11: 7787
fission product recoil separation in, 11: 6925(J)
fission product removal, 11: 657(J)
flow characteristics in loops, 11: 9827
flow measurements, manometer line for, 11: 9828
flow of UO_2 and ThO_2, 11: 1036
gas recombination in, 11: 13661(R)
heat transfer characteristics, 11: 9704
mechanical properties, 11: 8706(R)
physical properties, 11: 13893
physical properties of, relationship to engineering characteristics of slurry system, 11: 8658
precipitation of ThO_2, in reactor blanket systems, 11: 7861(R)
preparation, 11: 8381(R), 13676(R), 13677(R)
preparation, size measurement, and properties of uranium oxide slurries, 11: 11802
preparation, stability, viscosity, and radiation chemistry of $UO_3 \cdot H_2O$, 11: 12585(R)
preparation and properties, 11: 13486
processing of, conference papers on, 11: 6092
reactor criticality effects of settling, 11: 7802
reprocessing, design and cost estimates of plant for, 11: 10750(J)
studies of UO_2–NaK in loops to 600°C, 11: 10314(J)
thermal gradient effects on metallic, 11: 1854(J)

Reactor solutions
(See also Reactor fuels; Reactor slurries.)
analysis for Al and Cr, 11: 8296(R)
analysis for Cr, 11: 8297
analysis for corrosion products, 11: 4292(J)
analysis for Fe(III), 11: 9599
analysis for Mo, Sn, and Al, 11: 12973(R)
analysis for Ni, Mn, Cu, and Zr, 11: 10974
analysis of HRT, during pressurizer tests, 11: 7861(R)
analytical control for Homogeneous Reactor Test chemical processing plant, 11: 13604
cesium removal from, by ion exchange, 11: 7536(R)
chemical processing of aqueous homogeneous, 11: 13517(J)
chemical processing of HRT, 11: 7859(R)
corrosive effects, properties, radiation effects, 11: 8706(R)
corrosive effects on Pt, Ti, Zr, stainless steel, Sn–Zr, and Ni alloys, 11: 8449
corrosive effects on reactor construction materials, 11: 11803
corrosive effects on stainless steel, 11: 1866
corrosive effects on stainless steel and Ti, 11: 7861(R), 9587(R)
corrosive effects on Ta, Zr, Zircaloy-2, stainless steels, and Carpenter 20-Nb alloy, 11: 3809(R)
cost, of Li_2SO_4 addition to UO_2–SO_4–D_2O solutions, 11: 11770
critical dimensions of pipes carrying, 11: 6520
critical velocity of HRT, and corrosion inhibition, 11: 7859(R)
decontamination, 11: 9633(R), 13698(R)
decontamination by absorption of fission products, 11: 7836(R), 7837(R), 11634(R), 11635(R)

Reactor solutions (cont'd)
decontamination of, by CaF_2 adsorption of rare earth fission products, 11: 11662
delayed neutron emission, 11: 8611
determination of corrosion products in, 11: 9599
drying and recovery, 11: 13677(R)
flow pattern in HRE, and use of baffles in HRE core, 11: 7757
fuel cost for reactors fuelled with UO_2SO_4–Li_2SO_4–D_2O, 11: 13139
fuel sampling in HRE, 11: 7857(R)
gaseous radioactivity from HRT, during storage in dump tanks, 11: 10944
iodine removal by column stripping, 11: 11636(R)
iodine removal by gas stripping, 11: 11637(R)
iodine removal by reaction with stainless steel, 11: 8383(R)
iodine removal from, 11: 13646
phase studies of alkali or alkaline-earth oxide–UO_3–CO_2–H_2O systems at high temperatures, 11: 8286(R)
phase studies of Li_2O–UO_3–CO_2–H_2O systems at 250°C, 11: 11576(R)
phase studies on UO_2SO_4–$CuSO_4$–$NiSO_4$–H_2SO_4–H_2O systems, 11: 13692
physical properties, 11: 2878, 7788
plutonium recovery by solvent extraction with TBP, 11: 13639(R)
preparation, decontamination, and recovery, 11: 7835(R), 8381(R), 11632(R), 11633(R), 11798(R), 13675(R), 13676(R)
preparation of UO_2SO_4, 11: 11634(R)
process flowsheets for HRT, 11: 12535
processing, 11: 11053(R), 11609, 13007
processing, estimation of radiation intensity, 11: 8349
processing, underflow pot operation, 11: 3752, 3753
processing for U recovery, 11: 11634(R)
processing loop and removal of I_2 and Cs, 11: 7536(R)
processing of, analytical requirements for, 11: 11616
processing of, conference papers on, 11: 6092
processing of, survey, 11: 11603
processing plant design, 11: 7861(R), 11581
processing UO_2SO_4, 11: 10292
purification, 11: 13641
radiation stability, vapor pressure, thermal expansion, and corrosive properties of uranium oxide–H_3PO_4 solutions, 11: 1837
radioactivity induced in, 11: 4079
recovery of D_2O, 11: 7500(R)
removal of cesium, iodine, and rare earth sulfates, 11: 13951(R)
sampling apparatus for HRE, 11: 12585(R)
sampling HRT waste, equipment for, 11: 10860
stability, effect of corrosion products and Cu concentration, 11: 10283
stress corrosion tests in HRT mockup, 11: 9288
TBP processing for UO_2SO_4, 11: 12585(R)
uranyl sulfate, possibility of UO_4 precipitation, 11: 8620

Reactor stability
See Multiplication factor.

Reactor tampers
See Reactor reflectors.

Reactor thermal columns
(See also Reactor experimental facilities.)

Reactor thermal columns (cont'd)

neutron flux distribution, effect of air channels, 11: 8691(R)

neutron relaxation lengths in, 11: 12508(R)

Reactor tubes

boiling burnout data for Ni, 11: 8580

burnout tests for rectangular Ni, 11: 8719(R)

corrosion detection by x radiation, 11: 4535

creep of Zircaloy-2, 11: 4683

design, heat transfer, and friction studies on finned, for gas cooled reactors, 11: 5839

evaluation of Al-lined Zircaloy-2 for organic-cooled, 11: 11197

fabrication and welding of Be, 11: 7659(R)

fabrication of long thin-walled Zr, 11: 2498

fabrication of Zr Hanford-type, 11: 13764

film formation in, effects of radiation on, 11: 7741

heat transfer in finned, 11: 5838

leaks caused by mercury and stress corrosion, 11: 10960

materials, evaluation of Al, Al–Mg, Zr, 347 stainless steel, and Zircaloy-2 as, 11: 11193

materials for, for use with organic coolants, 11: 8170

materials for ETR and NRX reactors, 11: 12058

metallographic examination of Hanford discharged, 11: 8668

pressure drop of steam–water mixtures in, 11: 8893

remote welding, 11: 8687(R)

remote welding apparatus, 11: 8686(R)

slug chattering in, apparatus for observing, 11: 8666

sonic inspection, 11: 8902(J)

strength of Zr and stainless steel, for cooling SGR, 11: 8686(R)

surface friction distribution in finned, 11: 5838

ultrasonic decontamination, 11: 11915

Reactors

(See also general headings for types of reactors and names of specific reactors.)

analog computer methods of studying multiregion, and material balance in recycled-fuel, 11: 5018

application of minimum loading conditions to enriched, 11: 10312(J)

automatic neutron flux plotting, 11: 9103

bibliography of unclassified reports on power and test, 11: 5592

buckling, effect of multiplication constant, slowing down, and diffusion lengths, 11: 1337(J)

buckling of cylindrical, effects of eccentric control rods on, 11: 10315(J)

building uniform K factor, method, 11: 5106(P)

burnout of high cross-section fission products in, 11: 11779

calculations, specification of neutron flux and cross sections used in, 11: 3549

calculations for U-fueled, based on revised values for nuclear properties of Pu, 11: 8602

cavity, criticality and potentialities, 11: 6908

chemical aspects, 11: 683(J)

chemistry and metallurgy, role in nuclear energy project, 11: 1333(J)

control, abstract bibliography of classified and unclassified reports, 11: 644

control, evaluation of poisons for, 11: 9716

control, methods and theory, 11: 2132(J)

control and instrumentation, 11: 5615(J), 5616(J), 13517(J)

Reactors (cont'd)

control by poison elements, 11: 8689(R)

control materials, properties of B and B compounds, 11: 11818

control of, using soluble poisons, 11: 13867

control studies and power level determinations, 11: 4100

coolant radioactivity, method of computing, 11: 656

cooling, effects of coolant turbulence, 11: 4691

cooling, purification of H_2O for, 11: 11781

cooling after shutdown, 11: 10923(R)

corrosive effects of control poisons in, 11: 9716

critical concentration in, effect of poisoning, 11: 8590

critical constants Σ, k_{ex}, and λ as a function of τ, 11: 10923(R)

critical dimensions of bare cylindrical, spherical or cubical, 11: 3567(J)

critical properties of homogeneous annular region, iterative technique for studying, 11: 6924(J)

critical size and neutron distribution of bare and reflected, 11: 1656

critical size of, in terms of Bessel functions, 11: 2142(J), 2143(J)

critical volume of spherical, 11: 4104(J)

criticality, mathematical analysis, 11: 647, 6544(J), 13507

criticality and reactivity of mixed U and Pu fueled, effects of delayed neutrons, 11: 11782

criticality effect of moderator on fissile material, 11: 1715(P)

criticality theory, 11: 13860

cylindrical, effect of reflector on critical dimensions, 11: 3567(J)

delayed neutron effects on criticality and reactivity in mixed U and Pu fueled, 11: 11782

design, kinetics, and safety, 11: 13879

design and waste disposal, 11: 5006

design for plate-type fuel, 11: 9547(P)

design of, with large central irradiation cavities for materials testing, 11: 10317(J)

design of Berlin experimental, 11: 12256(J)

design of experimental reactor "Merlin" in Nordrhein-Westphalia, 11: 12258(J)

design of Frankfort experimental, 11: 12253(J)

design of Hamburg experimental, 11: 12257(J)

design of Munich experimental, 11: 12255(J)

design recommendations of a reactor operator, 11: 6926(J)

design using tubular fuel elements, 11: 4773(P)

design with cooling air gap and reduced neutron loss, 11: 9564(P)

design with reflector in tank for smaller critical mass, 11: 11536(P)

determination of transfer reactions, 11: 11316

development, 11: 8581

development in Europe, proposals for, 11: 7330

development, the role of metallurgy in, 11: 11787

diffusion and transport theories, 11: 8169

diffusion theory for anisotropic and inhomogeneous, variational principle for, 11: 7327

disadvantage factor calculated by method of successive generations, 11: 6530

effects of test-cell voids on reactivity, 11: 1669(J)

energy distribution of neutrons in infinite mediums in, 11: 1269

enriched vs. natural U, a debate, 11: 9130(J)

Reactors (cont'd)

enrichment cost of power increments gained by flattening and by close rod spacing, 11: 10281

equations for critical, formulation, 11: 6524

excessive absorption term of moderator, 11: 4682

for exporting, inquiries for, 11: 1660(J)

fast fission effect, variation with homogeneity in infinite slab, 11: 13150

fast neutron leakage from bare, 11: 1275(R)

fission product decay energy, 11: 655

fluctuations, effect on accuracy of neutron absorption cross section measurements, 11: 3543

flux estimates for fully reflected cylindrical, reflector savings method, 11: 1618(R)

flux measurements in multiplying lattice using europium oxide foils, 11: 13173

flux ratios in repeating slab arrays, mathematical analysis of, 11: 12233

flux transients, mathematical analysis, 11: 13515(J)

four-group theory, effective fast group cross sections in, 11: 10683

fuel burn up in, method of calculating, 11: 5617(J)

fuel consumption rate analysis, 11: 8685(R)

fuel consumption rate and Pu production in, calculations, 11: 9404(J)

fuel element loading and unloading device, 11: 11525(P)

fuel enrichment for various sizes of, method for rapid estimation, 11: 13941

fuel feedback of Pu, 11: 7846(R)

fuel pin rupture in uncontrolled, 11: 11792

fundamentals survey, 11: 660(J)

gamma heating calculations for rectanguloid, 11: 4672

general outline of a large number, 11: 10387(J)

graphite used in, 11: 4699(J)

group diffusion equation code for IBM-704, 11: 4102

group theory, 11: 1656, 4074, 11739(R)

group theory for, analysis of, 11: 9752(R)

Hanford effluent discharge, sampling, 11: 11666

hazards, symposium on, 11: 12590

health and safety activities, 11: 56(J)

heat evacuation devices for, 11: 4774(P)

heat exchangers, 11: 9117(J)

heat transfer, 11: 8588

heat transfer, mathematical analysis using lumped metal heat capacity, 11: 13718

heat transfer burnout, calculations, 11: 6707(J)

heat transfer coefficients during transients, 11: 3382

heat transfer in, abstracts, 11: 13720

heat transfer in, fuel burnout studies, 11: 12606

heat transfer progress, 11: 1848

high-performance heat transfer research, abstracts of papers on, 11: 1849

hot spot temperatures in the axial direction, effect of coolant inlet temperature and coolant temperature rise, 11: 1332

industrial application, review, 11: 3271(J)

instrumentation, control, and shielding, 11: 1333(J)

instrumentation, design and characteristics of ionization chambers for, 11: 5460(J)

instrumentation for control and monitoring, 11: 10748(J)

instrumentation for normal operation, 11: 2133(J)

Reactors (cont'd)

insurance problems, workmens benefits, 11: 56(J)

kinetic response to localized reactivity changes, 11: 10923(R)

kinetics, 11: 13965

kinetics, effect of delayed neutrons from U^{238} fissions and delayed neutron leakage, 11: 12614

kinetics, importance function in, 11: 9486(J)

kinetics, reviews, 11: 6929(J)

kinetics of a temperature flash and associated problems, 11: 7324

kinetics of stationary systems, 11: 682(J)

lifetime for given fuel loading, 11: 5022

low-power high-thermal-flux experimental, 11: 12261(J)

maintenance, 11: 10280

mathematical analysis, 11: 13507

mathematical analysis of fuel burnup and poison effects, 11: 9135(J)

mathematical analysis of off-center control rod, analytic two-energy group method, 11: 12874

maximum neutron flux in testing, 11: 4685(R)

in medical research and therapy, 11: 11394

multigroup, multiregion, one-space dimensional program using neutron diffusion theory, 11: 4075

multigroup, one-dimensional equations for, UNIVAC programs for solution, 11: 1314

multigroup analysis involving cylindrical space dimensions, 11: 5584

multigroup calculations, use of inelastic neutron spectrum in, 11: 2628

multigroup calculations for multiregion, 11: 1618(R)

multigroup method for calculation of quantities associated with spherical, 11: 13871

multigroup-multiregion theory for application to criticality and related computations, 11: 647

multigroup problems in two dimensions, iteration procedure for, 11: 2699

multigroup theory, 11: 9484(J)

multigroup theory of moving fuel, 11: 13935

multigroup theory solutions, 11: 9843

multiplication factor, 11: 8702

multiplication factor, effect of U enrichment on, 11: 1337(J)

multiplication factor, problems in application and design of neutron amplifiers, 11: 12265(J)

multi-region theory, boundary conditions for criticality and flux distribution calculations, 11: 2550

need for small power, 11: 14(J)

neutron absorption by absorbers in experimental holes, 11: 653

neutron and γ leakage flux from, theory, 11: 10968

neutron anisotropic elastic scattering and heat generation in, 11: 6489

neutron attenuation studied by pulsed technique, 11: 6005

neutron diffusion, Lil Abner code for IBM-650 for, 11: 1575

neutron diffusion, two-dimensional multigroup equations for, 11: 2698

neutron diffusion in, SOFOCATE computer code for, 11: 13510

neutron diffusion theory solutions by space simulators, 11: 2593

neutron distributions measured with β decays and photographic emulsions, 11: 2974

neutron energy distribution, method of measuring, 11: 14010

neutron flux and currents across gaps in one dimensional spherical, cylindrical and laminar systems, 11: 3077

Reactors (cont'd)

neutron flux distribution, 11: 13965

neutron flux distribution, effects of enrichment, 11: 2027(R)

neutron flux distribution in empty channels, theoretical thermal, 11: 10716

neutron flux measured by B coated thermocouples, 11: 3948, 3949

neutron flux measurement using In^{115} foils, 11: 5452(J)

neutron flux measurements, correction for finite resolution effects, 11: 10913

neutron flux measurements, performance of ionization chamber for, 11: 4571

neutron flux measurements by Np^{237} foils, 11: 11746(R)

neutron flux measurements in, design of automatic scanner for, 11: 2606

neutron flux measurements in, method for, 11: 9752(R)

neutron flux measurements using fission counters, 11: 489

neutron flux-spectra from foil activations, 11: 9000

neutron leakage and theory, 11: 4013(R)

neutron leakage past a step in an annulus, 11: 13217

nuclear characteristics, synthetic experiment design techniques for obtaining, 11: 8164

nuclear power generation, 11: 5(J)

one-dimensional transport theory, computer programming for, 11: 3551

operation, changes during, 11: 4705(J)

operation, design, and planning of present world, 11: 10309(J)

operation of shim and control rods, method for, 11: 11548(P)

oscillatory behavior of a two-phase natural circulation loop, theory, 11: 9279(J)

overshoot problems in control, 11: 4105(J)

peaceful uses, chemistry of processes in, 11: 10308(J)

physics of, book, 11: 8189(J)

poison procedures for control of, 11: 13867

poisoning, 11: 13965

poisoning, Xe transient characteristics, 11: 7830

power and temperature overshoots in, calculations, 11: 3545

power distribution of, oscillations in, 11: 10313(J)

power excursion tests, criticality studies, 11: 8677(R)

power generation after shutdown, 11: 2702

power level in, instrument for measuring time required to double, 11: 6440

power modulation, mechanism, 11: 3543

pressure transients in, 11: 12876

pressure vessels for, welding problems in, 11: 12066(J)

radiation damage dosage, 11: 8186(J)

radiation from clouds of debris from, monitoring, 11: 56(J)

radiations from, chemical dosimetry, 11: 12142(J)

radiations from, chemical dosimetry, 11: 1994(J)

radioinduced heating, calculations, 11: 9823

radioinduced heating of structures, ORACLE code for calculating, 11: 5647

reactivity, effect of delayed and prompt neutrons on, 11: 3552

reactivity, effects of thermal bowing of reactor fuel elements, 11: 5585

reactivity, methods of calculation, 11: 11746(R)

Reactors (cont'd)

reactivity and kinetic calculations on AVIDAC, 11: 11745(R)

reactivity changes, effect of Pu^{239} and fission product buildup, 11: 3543

reactivity changes for different loadings, 11: 8667

reactivity changes induced by neutron absorbers in, 11: 6529

reactivity determination, 11: 13944

reactivity effect due to neutron streaming in an empty tube, 11: 6919(J)

reactivity effects of fast fission, 11: 2636

reactivity effects of thermal expansion in reflected spherical cores, 11: 6069

reactivity measurements in, oscillator technique, 11: 13497

resonance escape probability and thermal utilization, effect of amount of moderator on, 11: 1337(J)

safety, effect of reliability of reactor, adequate control and supervision, and location, 11: 56(J)

self-shielding of lumped-poison mixtures, 11: 1382(J)

simulation of hot channel boiling in water cooled, 11: 11814

site selection problems, 11: 13516(J)

solution of problems by the resistance-network analog, 11: 12260(J)

solution of 2-region group theory with neutron streaming in cylindrical coordinates, 11: 7845(R)

stability of bubbling, 11: 4664(R)

startup, comparison of neutron sources, 11: 10961

startup, subpower range transients in, 11: 10994

startup simulation by electronic analog computer, 11: 6911(J)

statistical weight theorem for, theoretical derivation, 11: 4693

subcritical constants, 11: 682(J)

table of French, 11: 3083(J)

temperature coefficient of reactivity in, safety considerations, 11: 7806

temperature coefficients, methods of calculating, 11: 4656

test facilities for irradiating fuel elements, 11: 5019

theory, applications of Liapounov's Second Method, 11: 12138(J)

theory, computer routines for one-dimensional, one-group, 11: 4930

theory, lecture series on elementary, 11: 10979

theory and design, lecture notes, 11: 6931(J)

theory in two dimensions and two regions, 11: 2670

theory of, utilizing fast and thermal fission, 11: 12551

theory of neutron distributions and escape probabilities, 11: 8116(R)

theory of prompt over-critical, 11: 6902

thermal neutron fine structure in, effect of fuel plate removal on, 11: 5570

thermal neutron flux in, calculated by spherical harmonics method, 11: 682(J)

thermal performance of various fuel element geometries and coolants for non-boiling, method of comparing, 11: 5573

three-dimensional multigroup programming for computers, 11: 1325

transfer function measurement, 11: 13944

two-group, two-region calculations for spherical, "thin-shell" approximation, 11: 5005

two-group diffusion theory for multiple reflector spherical, 11: 682(J)

two-group equations for multi-region, 11: 10967

two-group three-region cylindrical approximation calculations, 11: 2693

unloading technique using steam and H_2 then HNO_3, 11: 5117(P)

utilization for research, Pu and power production, survey, 11: 1717

Reactors (cont'd)
variation of η during lifetime of slightly enriched U, 11: 10918
water cooling, effects of radiation, 11: 963
water cooling, influence of formation of corrosion films on Al, 11: 11684
xenon poisoning, mathematical analysis, 11: 2138(J), 5034(J), 6079
xenon poisoning, tables, 11: 12883

Reagents
See Chemicals and reagents; Flotation reagents; Grignard reagents.

Recapture Member (N. Mex.)
geology, 11: 2910(J)

Recoil ions
(See also Beryllium ions (recoil); Bromine ions (recoil); Fission recoils.)
effect of changes in hydration on, in neutron irradiated permanganates, 11: 11110(J)

Recorders
See Data recording systems; Line recorders; Magnetic recording systems.

Recovery
See Waste recovery.

Rectifiers
(See also Electron tubes; Power supplies.)
electric conductivity of Ge-junction, temperature effects on, 11: 8025(R)
oscillations in gas, 11: 8060(J)
performance of Se, 11: 3907

Red Desert Area (Wyo.)
exploration of U deposits, geology and mineralogy, 11: 5322(J)

Red Rock Claim (Mont.)
vein deposits, 11: 2908(J)

Redox Process
aluminum nitrate as salting agent in, and determination of Pu in presence of Al, 11: 7438
analytical control, 11: 11621
analytical control, decontamination, feed preparation, flowsheets, and operating control, pilot plants runs on, 11: 7475
analytical control, refractive indices of process streams, 11: 2340
analytical procedures for U and Pu, 11: 8367
chemical stability of iron sulfamate in process solutions, 11: 7525
corrosion of austenitic stainless steel by process streams, 11: 7526
corrosion of dissolver, 11: 13748
corrosion of mild steel in synthetic waste solutions from, 11: 9723
corrosion of stainless steel in, 11: 7614
corrosion of stellite and stainless steel in process streams, 11: 8454
corrosion of tungsten carbides in solutions, 11: 8453
corrosion of valves and valve seats, 11: 13754
crossover-oxidation step, 11: 12371
decontamination, Ce, 11: 11627
decontamination, effect of scrubbing on, 11: 7552
decontamination by Super Filtrol scavenging, 11: 8373
determination of Pu in presence of Al for complete Pu recovery, 11: 10825
determination of plutonium in uranium recovered by, 11: 13671
development, 11: 7534, 8380(R)

Redox Process (cont'd)
development and equipment operation, 11: 13022
development for separation of Pu and U from Hanford metals, 11: 13017(R)
development studies in solvent treatment, decontamination, Ru removal, 11: 8322(R)
extraction apparatus for, evaluation of, 11: 2341
extraction equipment, 11: 8370
extraction equipment, design specifications for mixer-settlers, 11: 13683
fission product removal procedures, 11: 8367
flowmeter design and instrumentation, 11: 13674
flowsheets and application of packed columns in, 11: 11971
hazardous material, 11: 985
heat transfer of tube bundles in evaporator, design and testing, 11: 3381
mixer-settler design and development, 11: 12403
mixer-settlers for, design and performance, 11: 13670
nitroalkane formation during irradiation, 11: 8320
operating control, 11: 8278
plutonium, Zr, and Cs decontamination factors, 11: 7552
plutonium precipitation in IIIBP solutions, 11: 8368(R)
pumps for, testing, 11: 8366(R)
raffinate processing, 11: 12998
raffinate processing by chemical precipitation, 11: 13636
raffinate processing for $Al(NO_3)_3$ precipitation, 11: 13004
ruthenium and zirconium decontamination, 11: 8368(R)
ruthenium removal by silica gel, 11: 9624
solution purification, 11: 13564(R)
solvent extraction of Pu in, 11: 11600
solvent extraction performance of IC columns using Raschig ring packing, 11: 12999
sulfamic acid in, 11: 7533
tube bundles for process vessels, fabrication and corrosion, 11: 3396
waste disposal, 11: 8283(R)
waste disposal, preparation for storage or future treatment, equipment, 11: 2472
waste evaporator corrosion, 11: 13749
waste solutions from, corrosive effects on mild and stainless steels, 11: 7523

Redwing Operation
fall-out monitoring following, by radiometric analysis of samples of fish, plankton, and water, 11: 5965

Reflection
equipment for measuring, 11: 6421

Reflectors
See Reactor reflectors.

Refractometric analysis
See Refractometry.

Refractometry
adaptation of spectrometer to, 11: 12796(J)

Refractories and crucibles
See Ceramic materials; Crucibles; Refractory coatings; Refractory materials.

Refractory coatings
(See also Ceramic coatings.)

Refractory coatings (cont'd)
development and evaluation of insulating type, for aircraft, 11: 1515(R)
fabrication of, for melting and casting U and other metals, review, 11: 4859(J)
properties and testing for lined reaction vessel, 11: 9713

Refractory materials
(See also Ceramic materials.)
corrosion, measurement by means of radioisotopes, 11: 7187(J)
corrosion, oxidation, and mechanical properties, 11: 7995(J)
corrosion by liquid metals, 11: 7677(R)
differential thermal analysis equipment for temperatures to 1575°C, 11: 11172
electrical resistivity, Hall constant, and magnetic susceptibility of transition metal borides, 11: 3389(R)
evaluation for use as bomb-linings in metal reduction of UF_4, 11: 7600
high temperature x-ray diffraction measurements of expansion, 11: 260
interfacial reactions with Ce and La, 11: 2851
preparation and testing of, for continuous reduction of UF_4 to F, 11: 9713
reactions of Ce and La with alumina and thoria, 11: 2420(R)
static corrosion by liquid Na, 11: 9747
technology at high temperatures, 11: 1861(J)
thermal length changes of refractory castables, methods of measurement, 11: 10077(J)
thermodynamic properties and melting point, 11: 6713

Refrigerants
for HRT secondary refrigeration system, 11: 3786

Registers
See Counting devices.

Regulators
See Current regulators; Frequency regulators; Level regulators; Power supplies; Pressure regulators; Thermostats; Voltage regulators.

Relativity theory
boundary conditions in the non-symmetric unified field theory, 11: 2204(J)
variation of electron mass with velocity, review of experimental evidence, 11: 10143(J)

Relays
design, scale-of-two circuits, 11: 10148
design criteria for servomechanism-type with 2 integrating elements, 11: 9375(J)
design triggered by overload in a r.f. line, 11: 3252(P)

Remote-control equipment
(See also Laboratory equipment; Servomechanisms.)
bibliographies, 11: 3908
description and operating procedures for DR Dolly, 11: 2293
design and performance, 11: 520(J)
design for decontaminating solutions, 11: 9540(P)
design for HRT maintenance, 11: 10292
design for melting and pouring radioactive metals, 11: 13334
design for sampling, 11: 13842
design of, for nuclear aircraft maintenance, 11: 8891
design of frictionless, releasable, holder, 11: 6993(P)
design of master manipulator for use with several slave arms, 11: 3222(P)

Remote-control equipment (cont'd)
design of rod gripper or holder for, 11: 11529(P)
design of temperature reading and control system, 11: 11539(P)
design of volumetric titrimeter, 11: 7126
master manipulator, design for more head room, 11: 3241(P)
performance for control of bulldozer for burial of radioactive waste, 11: 11149
radioisotope handling, 11: 9987(R)
review, 11: 7127(J)
slave arm, improved arrangement, 11: 5088(P)
temperature control with remote adjustment, 11: 7033(P)

Remote-viewing equipment
(See also Television equipment.)
design and performance for rear face viewing of Hanford piles, 11: 11732
design of liquid level indicator, 11: 9570(P)
television, closed circuit for Calder Hall, 11: 12117(J)
for underwater process operation, 11: 13006

Renardites
identity and conditions of deposition, chemical, optical, and x-ray data, 11: 1871(J)

Report lists
See Bibliographies.

Reproduction (animal)
See Animal reproduction.

Reproduction factor
See Multiplication factor.

Research and Isotope Reactor
See Production reactors.

Research Development Reactor
See Materials Testing Reactor.

Research reactors
(See also specific research reactors, e.g., Argonne Research Reactor; ORNL Research Reactor.)
British, design and uses, 11: 2135(J)
buckling experiments on ANL subcritical, 11: 1667(J)
calculations of critical masses, neutron fluxes, power levels, and fuel element specifications, 11: 8165
Canadian, design and uses, 11: 2134(J)
control and start-up of homogeneous, 11: 9792
converter plate design for homogeneous, 11: 9795
description of Netherlands high-flux, 11: 12266(J)
descriptions of Canadian, U. S., Russian, European, and U. K., book, 11: 4112(J)
design, 11: 12888(R)
design and characteristics of types of, 11: 4161
design and cost studies of heterogeneous and homogeneous, for engineering testing, 11: 12212
design and data for advanced engineering test, 11: 11389
design by ORSORT for research and isotope production, 11: 12528
design of Belgian BR-1, 11: 9136(J)
design of circulating fuel aqueous homogeneous, 11: 9804(R)
design of D_2O, for engineering testing, 11: 13490
design of 5-watt, 11: 674(J)
design of homogeneous, 11: 6907, 10292

Research reactors (cont'd)
design of homogeneous graphite moderated, for engineering testing, 11: 12241
design of low-enrichment, 11: 13862
design of MIT, 11: 3572(J)
design of Westinghouse Testing Reactor, 11: 1670(J), 12249(J)
design study of Mighty Mouse, 11: 10717
design study of Swiss, 11: 591(J)
development, 11: 13142
developmental studies, 11: 13165
for export, specifications, 11: 1665(J)
hazards summary for Battelle, 11: 4076
heat exchanger design, 11: 9793
international cooperation program in the peaceful uses of atomic energy, 11: 1391
kinetics, 11: 7842(R)
maximum flux obtainable in MTR-type, factors influencing, 11: 9052(R)
miniature, for laboratories, design of, 11: 1663(J)
neutron flux, 11: 11389
operation of Argonne, 11: 591(J)
operation of Savannah River, 11: 9829
physics experiments using, and review, 11: 591(J)
power generation with homogeneous, economics, 11: 9796
pressure shell stress analysis of homogeneous, 11: 10943
program in south, 11: 2775(J)
review of Harwell, 11: 7333(J)
selection and operation, 11: 1666(J)
shutdown, maintaining high-pressure system of HRR at temperature after dump, 11: 9801
start-up procedure for homogeneous, 11: 9807
survey of irradiation facilities, 11: 12087(J)
Swiss heavy-water, data sheet and specifications, 11: 1662(J)
thermal flux calculations for UCLA medical, 11: 2723
underwater lighting systems for, 11: 672(J)

Residues
See Uranium leach residues.

Resin ion exchange
See Ion exchange.

Resins
(See also Adhesives; Ion exchange materials; Plastics.)
adsorption bands, application of high-frequency analysis to, 11: 997(J)
analysis for N, 11: 178(R)
bibliography, 11: 10035
cation-exchange, distribution and behavior of water in, 11: 13295(J)
chemical and spectrographic analysis of radioactive and nonradioactive, 11: 12673
chemical stability and radiation effects, 11: 11607(R)
deuterization rate, 11: 13588
electric conductivity, temperature effects on, 11: 999(J)
elution, effect of temperature and $(NH_4)_2SO_4$ on, 11: 994
osmotic free energy, 11: 8284(R)
particle-size distribution and mechanical factors contributing to attrition, 11: 3754
preparation of borate form anion, 11: 178(R)

Resins (cont'd)
radiation effects, 11: 8338(R)
radiation effects on laminating, 11: 5808, 12692(R)
radiation effects on polyester coating Liquid Tile, 11: 11960
radioactivation analysis for Cd, 11: 2261
recovery of U from, with H_2SO_4, 11: 4365
silicone, adhesive properties and shear strength, 11: 5853(R)
silicone, synthesis and adhesive properties, 11: 6701
stripping for removal of corrosive elements, 11: 177(R)
testing H^+, NH_4^+, and Li^+, for cooling system applications, 11: 7328(R)
testing LiOH, for fission product removal, 11: 9109(R)
testing of demineralizer, 11: 1312(R)
thermal and radiation stability of, 11: 5029(R)
thermosetting, synthesis, 11: 208(R)
transport number, determination of, 11: 1829(J)
unsaturated polyester, effects of radioinduced polymerization, 11: 7128(J)

Resistance
See Electric conductivity.

Resistance furnaces
design, 11: 5891
design for heating powdered specimens to 1850°C, 11: 6715(J)
design for P production, 11: 2857
design for sintering UO_2 powders, 11: 13739
design of hot-pressing, for laboratory use, 11: 10016(J)
performance for sintering Ce_2S_3, 11: 7176

Resistance thermometers
calibration, compensating circuit for, 11: 3914(J)
corrosion in Hanford reactors, 11: 3909
design for nuclear reactor service, 11: 10621(J)
design of self-heating, for temperature control, 11: 4544(R)
metallurgical examination, corrosion of brazed joints, 11: 4540

Resistors
(See also Electric conductivity.)
current noise at low frequencies in high valued fixed, 11: 10147
radiation effects, 11: 8215
reliability, 11: 3911

Resonance cross sections
See Neutron resonance cross sections.

Resonance neutrons
capture integrals, 11: 3058(J)
detection and measurement with BF_3 counters, 11: 2979
measurement and capture integral tables, 11: 1654(J)

Resonance reactors
See Intermediate reactors.

Resonances
See Magnetic resonance; Nuclear magnetic resonance; Nuclear quadrupole resonance.

Resonators
(See Cavity resonators.)

Respiration
(See also Plant respiration.)
radiation effects on, in monkeys, 11: 6606(J)
of rat duodenal mucosa homogenates, effects of radiation, 11: 4239(J)

Respirators

efficiency for aerosol removal, 11: 2255

Respiratory cycles

(See also Metabolism.)

determination of $C^{14}O_2$, following ingestion of C^{14}-labeled compounds in rats, 11: 1406

Respiratory tracts

aerosol deposition, measurement, 11: 5735(J)

particle absorption, effects of wind velocity and particle size, 11: 11018

radon induced injuries to, of animals, 11: 5725(J)

Reticulo-endothelial system

distribution of inhaled radioactive particles by, 11: 8258(R)

function tests and radiosensitivity effects, 11: 7398(R)

phagocytic functions, influence of immunization and x irradiation, 11: 2778

protective effects of, against effects of wholebody x irradiation in rabbits, 11: 2237(R)

protective effects of stimulation against radiation injuries in rabbits, 11: 1725(R)

radiation effects on phagocytic activity in spleen, 11: 11840

radiosensitivity effects in rabbits, 11: 12961(R)

role in total-body response to radiation, 11: 2233(R)

stimulation, effects on radiation mortality in rabbits, 11: 8258(R)

tests of phagocytic function, 11: 2237(R)

uptake of colloidal thorium by, endocrine influences, 11: 5713(J)

Rhenium

ionization potential difference and variable valence, 11: 11071(J)

literature survey of chemical, physical and metallurgical properties of, 11: 300(R)

literature survey of preparation and properties, 11: 11222

polarographic determination in Mo ores, 11: 11586(R)

properties, 11: 348(J)

polarographic determination in molybdenum ores and flue dusts, 11: 8285(R)

reaction with ferrocyanides, 11: 100(J)

spectrophotometric determination in $HClO_4$ solutions, 11: 8296(R)

Rhenium chlorides

synthesis of $ReCl_5$ and related compounds, 11: 10045(J)

Rhenium compounds

infrared spectra of rhenium decarbonyls, 11: 131(J)

infrared absorption spectra of $Re_2(CO)_{10}$ and structure, 11: 131(J)

preparation and properties of $Rh(ClO_4)_3 \cdot 6H_2O$, 11: 4276

Rhenium isotopes

Coulomb excitation, 11: 573(J)

identification and decay properties, 11: 4927(J)

Rhenium isotopes Re^{183}

decay schemes, 11: 1304(J)

half life, 11: 3330(R)

Rhenium isotopes Re^{184}

preparation of source, 11: 10687(R)

Rhenium isotopes Re^{185}

Coulomb excitation, 11: 4054(J)

energy levels from Os^{189} decay, 11: 9162(J)

internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

neutron absorption cross sections, 11: 8677(R)

nuclear quadrupole moment, 11: 11381(J)

Rhenium isotopes Re^{186}

backscattering correction procedure test on, 11: 1690(J)

Rhenium isotopes Re^{187}

Coulomb excitation, 11: 4054(J)

internal conversion electrons following Coulomb excitation by α particles, 11: 6051(J)

nuclear quadrupole moment, 11: 11381(J)

Rhenium isotopes Re^{182}

beta and gamma spectra, 11: 1646(J)

gamma cascades in decay of, directional correlation measurements, 11: 3061(J)

neutron cross sections, 11: 1291(J)

Rhenium isotopes Re^{189}

half life, 11: 1291(J)

Rhenium oxides

chlorination for preparation of ReO_3Cl, 11: 11112(J)

heat capacity from 15 to 300°K, 11: 11576(R)

Rhenium oxychlorides

properties and preparation by chlorination of ReO_3, 11: 11112(J)

Rhodium

deuteron elastic scattering, 11: 5365(R)

electric octupole Coulomb excitation in, 11: 6067(J)

electrodeposition on Th, 11: 13783

K fluorescence yield, 11: 5545(J)

neutron reactions (n,p), angular on distributions and energy spectra, 11: 9141(J)

neutron scattering data, 11: 10229

polarographic determination in Pu-bearing solutions, 11: 12346

Rhodium–bismuth alloys

See Bismuth–rhodium alloys.

Rhodium fluorides

crystal structure of RhF_3, 11: 3711(J)

Rhodium isotopes

formation, identification, and energy of disintegration, 11: 469(J)

yields of, produced by reaction of π^- mesons with Ag, 11: 3022(J)

Rhodium isotopes Rh^{103}

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

energy levels, 11: 3533(J)

energy levels from neutron inelastic scattering, 11: 10705(J)

thermal neutron capture by, soft γ rays from, 11: 10757(J)

Rhodium isotopes Rh^{104}

gamma and beta spectra, 11: 8286(R)

Rhodium isotopes Rh^{105}

decay properties, 11: 774(J)

Rhodium isotopes Rh^{106}

gamma spectrum of 130 ± 2 min, 11: 12209(J)

isomers, 11: 684(J)

Rhodium isotopes Rh^{107}

gamma spectrum, 11: 4057(J)

Rhodium–uranium alloys

microstructure, 11: 8487(R)

thermal analysis, 11: 13042

Rhyolites

occurrence of U in, 11: 10539

Riboflavin

See Vitamin B_2.

Ribonuclease

radioinduced changes in activity in rat tissues, effects of cysteine treatment, 11: 11961(J)

radioinduced inactivation, 11: 5810(J), 5811

Ribonucleic acid

determination, 11: 13566(R)

synthesis, tracer study of enzymatic reactions, 11: 1492(J)

synthesis in E. coli, restoration after radioinduced block, 11: 881(J)

synthesis in mouse liver, effects of radiation, 11: 20

Ribonucleic acid, desoxy-

incorporation of P^{32} into, of regenerating mouse liver, effects of irradiation, 11: 4233(J)

influence of released desoxyribonuclease on, in irradiated rat spleen, 11: 9194(J)

levels in bone marrow, spleen, and liver of irradiated rats, effects of methionine treatment, 11: 11882(J)

radiation degradation in aqueous solution by 200 kv x rays, 11: 4340(J)

radiation effects on, 11: 8766, 9923(J)

Riley Area (N. Mex.)

geophysical exploration, 11: 11191

Riveted joints

creep under constant loads and temperatures, 11: 6375

RMF

See Reactivity Measurement Facility.

Rock Creek Placer Area (Idaho)

exploration, geology, and mineralogy, 11: 4439

Rock drilling

apparatus for prospecting radioactive minerals, 11: 1713(P)

Rock salt

See Sodium chlorides.

Rocket fuels

See Fluid propellants; Solid propellants.

Rocket motor nozzles

fabrication by hot pressing BeO, 11: 8908, 10524

Rockets

(See also Guided missiles.)

design for sampling atomic clouds, 11: 5125

fabrication of heat-resisting parts from non-metallics, 11: 12080(J)

fuel development for nuclear, 11: 9121(J)

heat transfer analysis of thermonuclear powered, 11: 8895(J)

nuclear fuel for long-range, Soviet studies, 11: 3267(J)

Rockets (cont'd)

nuclear heat release problems, 11: 9122(J)

sled with 1600 and 3000 ft/sec velocities, design, 11: 8072

Soviet studies in astronautics, 11: 13359

steady nuclear combustion in, 11: 823(J)

survey of Russian literature on, 11: 4492

Rocks

(See also Carbonaceous rocks; Igneous rocks; Phosphate rocks; Silicate rocks.)

autoradiographic determination of radioactivity, 11: 5455(J)

density at high pressures, shock wave effects, 11: 5364

dielectric constants of, in frequency range 50 cps to 30 megacycles, method of measurement, 11: 12036

isotopic analysis for Pb, 11: 8001(J)

radiometric analysis for In, 11: 11935(J)

use of liquid emulsions in study of radioactivity of, 11: 2907(J)

Rocky Mountain Nuclear Power Study Group, Idaho Falls, Idaho

progress reports, 11: 821(R)

Rods

(See also Reactor control rods; Reactor fuel rods.)

thermal stresses in long cylindrical U, 11: 8757

Rolling mills

for thin, wide, high-strength, high-temperature aircraft metals, survey, 11: 11219

Roots

radiation effects on condition of sugar beets during storage, 11: 6193(J)

radiosensitivity of broad bean, 11: 7063(J), 11859(J)

Roscoelites

processing for U recovery, comparison with carnotites, 11: 2309

Rosin

See Resins.

Rotameters

design of electronic, 11: 11174

for metering F_2 and HF flow, 11: 6661

performance of a venturi flowmeter, 11: 10532

testing of design for use with liquid metals, 11: 13379

Rotary pumps

(See also Centrifugal pumps.)

performance in Fluoride Volatility Process, 11: 11968

testing of, for use in in-pile circulating loops, 11: 10866

Rubber

(See also Elastomers; Plastics; Silicon rubbers.)

gamma penetration through square slabs, 11: 2161

post-irradiation oxidation, 11: 965(J)

radiation effects, 11: 4161, 8747(R), 8857

radiation effects on, exposed to pile water, 11: 7886

radiation effects on natural and synthetic, 11: 6674

radiation vulcanization of natural, butadiene-styrene, butadiene, and nitrile, 11: 767(J)

tensile properties, effects of pile radiation on, 11: 12983

Rubidium

activation determination in rocks, minerals, and meteorites, 11: 9232(J)

Rubidium (cont'd)

chromatographic separation of, and Cs, analytical uses of complexone III, 11: 10482(J)

energy levels from Coulomb excitation, 11: 2090(J)

excretion in rats, tracer study, 11: 4809(J)

flame photometric determination, 11: 12973(R)

gamma spectra, 11: 2090(J)

handling and purification, 11: 8531

metabolism, tracer studies using Rb^{88}, 11: 11021(R)

neutron total cross sections and resonances in kev region, 11: 4047(J)

physical and chemical properties, 11: 8531

solvent extraction of carrier-free, 11: 5365(R)

spectrographic determination in beryls, mica, and feldspars, 11: 11933(J)

Rubidium (liquid)

corrosive effects on Inconel, 11: 8531

density of, measurement, 11: 10119(J)

Rubidium alloys

crystal structure, 11: 1878

Rubidium borohydrides

heat of solution in liquid NH_3, 11: 3681

Rubidium chlorides

chromatographic separation from alkali metal halides using $C_6H_5OH-CH_3OH-HCl$, 11: 4830(J)

crystalline structure under 11,000 and 7500 kg/cm^2 pressure at room temperature, 11: 9360(J)

Rubidium fluoride–beryllium fluoride systems
See Beryllium fluoride–rubidium fluoride systems.

Rubidium halides

energy level calculations for F-centers and interstitial positive ions in, 11: 12777

Rubidium iodides

crystalline structure under 11,000 and 7500 kg/cm^2 pressure at room temperature, 11: 9360(J)

Rubidium isotopes

hyperfine structure separations and magnetic moments, 11: 12867(J)

neutron resonances, 11: 9448(J)

separation by electromigration, 11: 8989(J)

spins of, of masses 81, 82, 83, and 84, 11: 608(J)

Rubidium isotopes Rb^{79}

production in Cu + O, Cu + Ne, and Ga + N reactions, 11: 3937(J)

Rubidium isotopes Rb^{81}

nuclear spin of Rb^{81m}, 11: 1649(J)

Rubidium isotopes Rb^{82}

decay schemes, resolution of discrepancies, 11: 10687(R)

Rubidium isotopes Rb^{84}

gamma spectrum, 11: 6865(R)

Rubidium isotopes Rb^{85}

energy level at 517 ev, lifetime measurement by time to pulse height conversion, 11: 2071(J)

ionization of, following beta decay of Kr^{85}, 11: 12938(J)

photoneutron emission, 11: 4614(R)

Rubidium isotopes Rb^{86}

angular correlations in β-γ cascade, 11: 1699(J)

Rubidium isotopes Rb^{86} (cont'd)

beta spectra, analysis of complex, 11: 768

myocardial uptake following intravenous injection, 11: 5751(J), 5752(J)

Rubidium isotopes Rb^{87}

half life, 11: 5374(J)

half lives, determination of, 11: 8001(J)

neutron total cross sections, 11: 9189(R)

photoneutron emission, 11: 4614(R)

Rubidium isotopes Rb^{88}

gamma spectra, 11: 8286(R)

Rubidium isotopes Rb^{89}

decay properties, 11: 11576(R)

gamma spectra, 11: 8286(R)

Rubidium uranyl nitrates

crystal structure of $Rb_2UO_2(NO_3)_4$, 11: 2842(J)

Rupture

(See also Thermal rupture.)

calculation of maximum size of ductile, in pressurized systems, 11: 13306

machine for testing stress-, at 2000 to 2500°C, 11: 10152(J)

statistical analysis of tests involving more than two metal types, 11: 13921

Russian reactors

design of Be moderated, 11: 5618(J)

design of power station, 11: 681(J)

design of research, 11: 591(J)

development, 11: 11(J)

development for power, 11: 10388(J), 11832(J)

multigroup calculations for power station, 11: 677(J)

physical and thermal calculations on power station, 11: 4700(J)

physical characteristics of power station, 11: 676(J)

water-cooled, graphite-moderated, enriched U, data sheet, 11: 1664(J)

Rust
See Corrosion; Iron oxides.

Ruthenium

absorption spectra, 11: 8380(R)

absorption spectra in perchloric acid solutions, 11: 13576(R)

analytical procedures for, conference on, 11: 7404

behavior in purification of irradiated U by zone melting, 11: 4446

charge per atom determination, 11: 4814(R)

chloro complexes of, 11: 8267(R)

decontamination by coprecipitation with Bi, 11: 13579(R)

determination in organic samples, extraction method, 11: 11083

determination in Redox streams and removal, 11: 8322(R)

determination in Thorex Process streams, 11: 3697

distillation from HNO_3, 11: 11623

distillation in Purex acid waste evaporation, 11: 7491

distribution between Mg and U–Fe alloys, 11: 9581(R)

electrode potentials of Ru(VII)-Ru(VIII) couple, 11: 11074(J)

electrodeposition, 11: 8283(R), 12339(R)

extraction into esters and ketones, 11: 8267(R)

Ruthenium (cont'd)
ionization potential difference and variable valence, 11: 11071(J)
liquid metal extraction from Cr–U alloys, 11: 7677(R)
oxidation by potassium periodate, 11: 9624
particulates, percutaneous and gastrointestinal absorption and tissue distribution in rats, 11: 13572
radiometric determination in seaweed ash, 11: 5213
recovery by electrodeposition, 11: 8380(R)
recovery from aqueous raffinate from irradiated-U processing, 11: 11506(P)
recovery from solutions of irradiated U, 11: 9539(P)
removal from Redox solutions by silica gel, 11: 9624
removal from solution with a precipitator-column, 11: 5818
separation from Cs, Te, and rare earths using anion exchange, 11: 9263(J)
solubility in liquid metals, 11: 7681(R)
solvent extraction, 11: 7969
spectrophotometric determination with 1,10-phenanthroline, 11: 13271(J)
tissue distribution following chronic feeding in rats, tracer study, 11: 3649
tissue distribution in plants and animals, 11: 8257(R)
volatilization of, during HNO_3 recovery in the Purex Process, 11: 8376
x-ray emission determination in U alloys, 11: 7408(R)

Ruthenium fluorides
crystal structure of RuF_5, 11: 3711(J)
preparation, 11: 7404

Ruthenium ions
oxidation states, species, spectra, and potentials, 11: 8825

Ruthenium isotopes
in aerosols, impaction by respirators, 11: 2255
formation, identification, and energy of disintegration, 11: 469(J)
yields of, produced by reaction of π^- mesons with Ag, 11: 3022(J)

Ruthenium isotopes Ru^{97}
decay properties, 11: 774(J)

Ruthenium isotopes Ru^{103}
buildup in Th breeder reactors, 11: 1373
decay properties, 11: 774(J), 2580

Ruthenium isotopes Ru^{104}
Coulomb excitation, angular distribution of γ radiation from, 11: 6878(J)

Ruthenium isotopes Ru^{105}
decay properties, 11: 774(J)
gamma spectra, 11: 13430(R)

Ruthenium isotopes Ru^{106}
buildup in Th breeder reactors, 11: 1373
decay scheme, disintegration rate, and ratio to Ru^{103} as a function of time, 11: 2580
detection and measurement in plants, 11: 11048(J)
formation from action of deuterons on Pd and neutrons on Ag, 11: 684(J)
half life, 11: 1292(J), 3526(J)
pathological effects of ingested, in rats, 11: 11877(R)
permissible concentration in drinking water, 11: 3649, 11877(R)
radiometric determination in plants, 11: 8790(R), 8791(R)

Ruthenium nitrate complexes
solvent partition of nitrato nitrosylruthenium in HNO_3–TBP systems, 11: 13289

Ruthenium oxides
acidity determination, 11: 12339(R)
chemical properties, 11: 13575(R)
solvent extraction, 11: 7404

Ruthenium–uranium alloys
constitution diagrams, 11: 4464, 8926
quenching experiments, 11: 13042

Rutiles
(See also Titanium oxides.)
radiation effects, 11: 1922(R)

Rutin
radiosensitivity effects, 11: 5744(J), 5745(J)

S

S1C
See Submarine Reactors (S1C).

S1G
See Submarine Intermediate Reactor.

S2G
See Submarine Intermediate Reactor.

S3G
See Submarine Advanced Reactor.

S4G
See Submarine Advanced Reactor.

S1W
See Submarine Thermal Reactor (Mark I).

S2W
See Submarine Thermal Reactor (Mark II).

S3W
See Submarine Fleet Reactor.

S4W
See Submarine Fleet Reactor.

S5W
See Submarine Reactors (S5W).

S particles
(See also K particles; Mesons (κ); V particles.)
decay, 11: 2014

S-Process
See Dual Temperature Process.

Sabina Mountain Prospects (Texas)
geology and distribution of U minerals, 11: 1087(J)

Saccharides
See Polysaccharides.

Saccharose
See Sucrose.

Saclay Reactor
operation, 11: 591(J)

Safety hazards
(See also Dust hazards; Health physics; Radiation detection instruments; Radiation protection; Remote-control equipment.)
from criticality accidents, 11: 11560

Safety hazards (cont'd)

financial protection against atomic hazards, 11: 3647(J)

from Sr^{90} in fall-out from atomic explosions, 11: 4257(J)

of Redox Process chemicals, evaluation, 11: 985

Safety rods
See Reactor control rods.

Salamanders

radiation effects on hematopoietic system, 11: 1739(J)

regeneration of nerves following radiation injury, 11: 5169(J)

Salcomine
See Cobalt complexes.

Salicylic acid, sulfo

analytical uses for selective elution of Be from Dowex-50 resin, 11: 7974(J)

Salivary glands

enzymatic activity, effects of irradiation in exteriorized rat, 11: 23(J)

functions, radiation effect, 11: 6151(J)

iodine uptake and radiation dosage determinations following therapeutic doses of I^{131}, 11: 6216(J)

Salt–metal systems (liquid)
See Metal–salt systems (liquid).

Saltex Process
See Purex process.

Salting-out agents
See Solvent extraction processes.

Salts

(See also Fused salts; Paramagnetic salts.)

molten solutions, transference in binary, 11: 6652(J)

solubility in organic solvents, 11: 9222(J)

Samarium

(See also Rare earths.)

heat of sublimation, 11: 4632(R)

magnetic susceptibility from 1.5 to 300°K, 11: 9171(J)

neutron resonance cross sections, 11: 12888(R)

neutron total cross sections, 11: 1276(R), 2026(R)

physical and chemical properties, 11: 5816(J)

proton scattering cross sections, 11: 1542(R)

separation from rare earth oxides by carbon reduction and distillation, 11: 10030(J)

solubility in liquid NH_3, 11: 1474

spectrographic determination, 11: 12973(R)

Samarium compounds

preparation, crystal structure, and properties of SmN, 11: 1470

Samarium fluorides

crystallographic data, 11: 6431(J)

Samarium isotopes Sm^{145}

gamma spectra, 11: 11740(R)

nuclear properties, 11: 8284(R)

Samarium isotopes Sm^{149}

capture of polarized neutron by polarized, 11: 2621

fission yield, 11: 3543

neutron absorption cross sections, 11: 4983(J)

neutron capture cross sections, 11: 13965

Samarium isotopes Sm^{149} (cont'd)

produced by fission, 11: 13965

reactivity effects on MTR with U^{235} and Pu^{239} fuels, 11: 13496

reactor criticality effects, 11: 13965

thermal neutron capture by, soft γ rays from, 11: 10757(J)

Samarium isotopes Sm^{152}

gyromagnetic ratio of 2^+ excited state, 11: 12186(R)

internal conversion lines, 11: 4173(J)

lifetimes, determination by method of delayed coincidences, 11: 8227(J)

radiation emission, 11: 1272

Samarium isotopes Sm^{153}

decay scheme, 11: 775(J), 11312(J)

gamma spectra, 11: 11740(R)

Samarium isotopes Sm^{155}

gamma spectra, 11: 11740(R)

Samarium nitrates

thermolysis, 11: 972(J)

Samarium oxide–gadolinium oxide systems
See Gadolinium oxide–samarium oxide systems.

Samarium oxide–stainless steel systems

analysis for Sm_2O_3 content, 11: 10817

Samarium oxides

catalytic properties, 11: 4353(J)

ceramic properties, 11: 3391(J)

crystal structure and preparation, 11: 130(J)

crystal structure of monoclinic Sm_2O_3, 11: 8863(J)

determination in cermets, 11: 10817

sinterability at various temperatures in oxidizing and reducing conditions, 11: 970

thermal expansion coefficient from 30 to 740°C, 11: 7964

Sampling

apparatus for liquid waste lines, 11: 11518(P)

capillary tube and in-line system, 11: 10532

continuous procedures for, 11: 1499

devices for aerosols, critical comparison of collective efficiencies, 11: 8039(J)

design of annular impactors for air, 11: 6435

equipment for, HRT waste evaporator solutions, 11: 10860

equipment for remote, 11: 13842

of gases under pressure, procedure for, 11: 7946

of liquid CO_2 with small heated cylinder, 11: 6255

manual for scientific technician, 11: 9593

mathematical theory, book, 11: 10645(J)

methods in screening radioprotective compounds with mice, 11: 11885(J)

performance of filter samplers for aerosols, 11: 10122

of radioactive UO_2SO_4 in HRT, 11: 9468

at various radioactive levels in Arco Chemical Plant, 11: 2282

San Bernardino Mountain Area

uranothorites, geological exploration, 11: 3829(J)

Sands

(See also Black sands; Monazites; Quartz; Silicon oxides.)

fluidization with $UF_4 \cdot {}^3/_4\ H_2O$ in Fluorox equipment, 11: 12965(R)

gamma spectra from point sources in, 11: 5523(J)

exploration, geology, mineralogy, and placer deposits, 11: 4436

Sanitary engineering

disposal of AEC-wastes, 11: 1026

SAPL Assemblies

See KAPL Intermediate Power Breeder Critical Experiments.

Sapphires

color centers and spectra, 11: 7455(R)

corrosion, 11: 8707(R)

corrosion by uranyl sulfate solutions, 11: 7609

radiation effects, 11: 1922(R)

Sarcomas

(See also Carcinomas.)

therapeutic effects of radioactive methionine on, in animals, 11: 3673(J)

Satellites

conference on research vehicles, Franklin Institute, 11: 1545(J)

descent and recovery, 11: 9344

relativity theory of man-made, 11: 2939(J)

Soviet studies in astronautics, 11: 13359

survey of Russian literature on, 11: 4492

temperature of, in motion, 11: 10117(J)

Savannah River Production Reactors

cleaning, 11: 12593

cooling system noise level determination, 11: 8709

loading to criticality in air and He, 11: 12592

materials reactivity effects measurement facility design, 11: 13918

moderator monitoring for F^{17}, 11: 8839

moderator purification, 11: 3346

moderator storage tank filling procedure, 11: 11805

startup, critical loadings for air and He, 11: 12592

stress analysis of tanks, 11: 9830

waste disposal, 11: 12717

Savannah River Test Reactor

design, 11: 13987

Saws

See Cutting tools.

Scalers

decoding matrix for, 11: 9587(R)

design, employing a ten-channel time analyzer, 11: 1224(J)

design and circuits, 11: 1276(R)

design of fast multi-event, 11: 5463(J)

design of high-speed print-out, 11: 12068(R)

development of decade, at ORNL, 11: 4544(R)

performance, for counting bursts of radiation, 11: 5967(J)

for pulse-height spectrometry, 11: 9373(J)

pulse scaling circuit, 11: 8255(P)

simultaneous control of assemblies containing two to eight, 11: 2600

Scandium

solvent extraction, 11: 13633(R)

Scandium (cont'd)

solvent extraction by TBP HCl and TBP–HNO_3 systems, 11: 1000(J)

solvent partition, 11: 11563(R)

spectrographic determination in minerals and ores, 11: 10468(J)

Scandium isotopes Sc^{43}

decay properties, 11: 626(J)

Scandium isotopes Sc^{45}

energy levels, 11: 626(J)

neutron total cross sections and resonances in kev region, 11: 6065(J)

Scandium isotopes Sc^{46}

beta-gamma polarization correlation in a J-J transition, 11: 13467(J)

beta spectra, 11: 772(J)

decay schemes, 11: 9161

half life, 11: 1292(J), 6054(J)

radioactive tracer study of sewage systems using, 11: 6628(J)

Scandium isotopes Sc^{47}

decay properties, 11: 1698(J), 5069

Scandium isotopes Sc^{48}

decay scheme and energy spectra, 11: 13449(J)

Scandium isotopes Sc^{49}

decay properties, 11: 626(J), 11576(R)

Scandium nitrates

thermolysis, 11: 972(J)

Scattering

adiabatic approximation to, 11: 1687(J)

amplitude at very high energies, asymptotic behavior, 11: 6950(J)

analog method for studying multiple, 11: 11464(J)

approximation method for short-wave-length or high-energy, 11: 3192(J)

back-, from dielectric coated infinite cylindrical obstacles, 11: 7351(J)

Bethe-Salpeter equation for nucleon-nucleon and meson-nucleon, solutions of, 11: 1688(J)

calculation of, from a complex square well by a variational method, 11: 11267(J)

calculation of incoherent neutron, by polycrystals, 11: 5059(J)

collision matrix for rotational excitation in adiabatic approximation, 11: 10345(J)

conferences on, 11: 6506(J)

contribution of electric field of nuclei to γ elastic, 11: 6946(J)

contribution of tensor forces to n-α, 11: 4733(J)

Coulomb excitation, review, 11: 11461

dispersion relation for all angles of, 11: 12952(J)

dispersion relations for forward, of spin zero particles by an extended potential, 11: 5658(J)

dispersion relations for forward meson-nucleon, 11: 4731(J)

duration of atomic collisions, 11: 4727(J)

effect of inelastic, in analysis of scattering resonances, 11: 2026(R)

elastic, of high-energy particles, 11: 8207(J)

elastic, of particles by a force center according to the radiation damping theory, 11: 9152(J)

energy loss in electronic collisions, theory, 11: 8116(R)

errors in constant-sagitta, measurements in nuclear emulsions, 11: 3495(J)

Scattering (cont'd)
in field theory, 11: 2169(J)
in gases, equations for angular distributions in, 11: 8203(J)
graphical determination of paths of scattered particles, 11: 1679(J)
of high-energy Dirac and Klein-Gordon particles, 11: 1634(J)
high energy limit of potential, non-relativistic kinematics, 11: 12921(J)
higher order radiative corrections to electron, 11: 5062(J)
inelastic high-energy nucleon, on light nuclei, 11: 5649(J)
inelastic problems, effectiveness of variational methods, 11: 8214(J)
matrix construction of a two-nucleon system, 11: 8208(J)
matrix for intermediate system, 11: 4146(J)
matrix for particles with arbitrary spin, 11: 4209(J)
matrix insensitivity, 11: 808(J)
multiple, first passage problem in theory, 11: 7353(J)
multiple production of particles in high-energy, 11: 2168(J)
of particles with given total angular momentum, theory, 11: 4735(J)
of particles with spin 0 on particles with spin 0 and ½, theory of mechanical phase analyzers for treating data, 11: 4159(J)
phase and bound states, relation between, 11: 9521(J)
phase shift analysis of high-energy p-p, 11: 9155(J)
polarization in high-energy, review, 11: 5496(J)
polarization of beam of spin one particles after elastic, by spin zero nuclei, 11: 9180(J)
potential, at high energies, formulation of, 11: 12924(J)
potential, uniqueness of solutions to dispersion relations for, 11: 12923(J)
problems in field theory, 11: 10336(J)
quantum field theory of, involving composite particles, 11: 6169
quantum mechanical theory of multiple, 11: 5075(J)
of radiation with frequency spreading, 11: 8202(J)
solutions to Low's equation, 11: 6147(J)
survey of high-energy, and polarization, 11: 3096(J)
symmetries in elastic spin ½-spin 0, 11: 13536(J)
theory, applications of, 11: 10771
theory, application to many-body problems, 11: 5690(J)
theory, Low's equation and S-matrix, 11: 13543(J)
theory, state spaces in, 11: 12925(J)
theory of high-energy, 11: 743(J)
theory of multiple, 11: 5650(J)
transfer equation for strongly anisotropic, 11: 9177(J)
variational treatment of atomic, 11: 5055
of zero spin particles considering attenuation, 11: 735(J)

Scattering cross sections
(See Meson scattering cross sections; Neutron scattering cross sections; Proton scattering cross sections; Deuteron scattering cross sections; Electron scattering cross sections.)

Schenectady Resonance Reactor
See KAPL Intermediate Power Breeder.

Schroeckingerites
occurrence in Red Desert Area (Wyo.), 11: 5322(J)

Schwarzkopf Development Corp., Yonkers, N. Y.
progress reports, 11: 3412(R)
progress reports on evaluation of new high temperature materials, 11: 1119(R)

Schwarzkopf Development Corp., Yonkers, N. Y. (cont'd)
progress reports on Hall constant and magnetic susceptibility of transition metal borides, 11: 3389(R)

Scintigrams
See Scintillation detectors.

Scintillation
gaseous, mechanisms, 11: 6482(J)
phosphor concentration vs. emission intensity, 11: 9502(J)
suspension counting in gels, 11: 503(J)

Scintillation counters
See Radiation detection instruments (pulse type); Scintillation detectors.

Scintillation detectors
(See also Phosphors.)
alpha, for hands and clothing, 11: 5454(J)
anthracene, response to low-energy electrons, 11: 6818
anticoincidence, design and use of, 11: 12504(R)
application to γ-ray dosimetry, 11: 2597
background radiation detected by NaI crystals, analysis, 11: 4583(J)
boron-loaded liquid, neutron, 11: 10192(J)
coincidence circuit for spectrometer using, 11: 3496(J)
coincidence counting with, techniques in high-resolution, 11: 495(J)
counting efficiency of liquid, 11: 5969(J)
decay times of organic, 11: 517(J)
design and operation for gamma counting, 11: 11326
design and performance, 11: 12963(R)
design and performance of, for γ emitter mixtures, 11: 10195(J)
design and performance of well-type NaI(Tl) crystal, 11: 13579(R)
design for continuous monitoring of sea water, 11: 878
design for use with tritiated water, 11: 8082
design of doorway, 11: 2985(J)
design of liquid, for neutron detection, 11: 8735(R)
design of plastic, for γ counting, 11: 510(J)
design of thin plastic fission, 11: 8996
designed to detect stars produced in phosphor by cosmic radiation, 11: 2951(J)
for detection of β particles, performance, 11: 2599
development, and fluorescence spectra of plastic, 11: 6863(R)
development, use of plastic and liquid phosphors, 11: 3472(J)
development for neutron spectrometers, 11: 4568
development of large-volume liquid, 11: 10329
development of liquid, for analysis of tritium in water, 11: 6841(J)
efficiency of NaI crystals for γ-ray detecting, 11: 488
employing mixed scintillating media, performance for radiation dosimetry, 11: 4942(J)
fabrication of α counting, insensitive to surrounding light, 11: 2984(J)
fatigue effects of photomultipliers in, 11: 1991(J)
gamma spectrometry using, techniques, 11: 4581(J)
growing of organic phosphors for, 11: 3963(J)
intrinsic resolution, 11: 6482(J)
introduction of labeled C into liquid, using paraldehyde, 11: 3962(J)
ion detection with, in mass spectrograph, 11: 2970(J)
neutron energy measurements with double pulse, 11: 4593(J)
peak efficiency of NaI(Tl), for γ rays from 0.150 to 7.5 Mev, 11: 4586(J)

Scintillation detectors (cont'd)
performance, 11: 1980
performance, employing large plastic discs as scintillators, 11: 1981
performance, for external monitoring for ingested or inhaled fission products, 11: 6209(R)
performance as automatic brain scanner, 11: 4591(J)
performance for aerial surveying, 11: 5437
performance for α measurements, 11: 3954
performance for analysis of low levels of Rn, 11: 4590(J)
performance for β counting, 11: 7271(J)
performance for β detection when employing scintillating gel incorporating C^{14}, 11: 7281(J)
performance for γ detection, 11: 8562(R)
performance for γ detection in biological materials, 11: 6473(J), 8083(J)
performance for liquid counting of weak β-emitters, 11: 10647
performance for making Au^{198} scintigrams of human intact liver, 11: 8258(R)
performance for measurement of γ-activity of human subjects, 11: 7268(J)
performance for whole-body counting of man, 11: 4251(J), 4584(J)
performance in determinations of radioactivity of human body, 11: 9001(J)
performance in monitoring dissolver off-gas for I^{131} content, 11: 10175
performance in portable α monitor, 11: 10660(J)
performance of, in x-ray analysis, 11: 490(J), 1601(J)
performance of α well-type, 11: 3955
performance of CaF_2 crystals, 11: 12339(R)
performance with gamma rays in liquids, 11: 9577(R)
phosphor backscattering in electron counting, correction for, 11: 1690(J)
phoswich system for particle identification, 11: 9023(J)
physical properties of a plastic fluor for use as, 11: 1580
potting of photomultipliers for use with liquid, 11: 1605(J)
properties of liquid, containing heavy elements, 11: 6482(J)
properties of organic, 11: 6505(J)
in prospecting for radioactive ore deposits, 11: 10184(J)
relative scintillation intensities of Cherenkov counter media, 11: 6482(J)
response of total absorption spectrometers using, to γ rays, 11: 4582(J)
for soft-β paper chromatograms, 11: 2986(J)
spectrometer with constant relative channel width, 11: 8094(J)
temperature effects in gas-free liquid, 11: 6482(J)
thermal quenching in α- and γ-excited liquid, 11: 4944(J)
time response, 11: 4585(J), 6482(J)
use of large liquid, as neutron spectrometers, 11: 5964
window unit for α particle, 11: 3642(P)
zinc S(Ag) in B_2O_3, detection of thermal neutrons in presence of intense γ rays, design and use, 11: 2613

Scintillators
See Phosphors.

Scintillogs
See Radiation detection instruments (ion current type).

Scioto River
monitoring for fluoride content, 11: 6222

Scott Valley Area (Idaho)
exploration, geology, and mineralogy, 11: 4438

Screens
(See also Filters.)
modifications for 190-C valve pit 24-in. header, 11: 3782

Scrubbers
(See also Extraction apparatus; Spray columns.)
design and performance of wet, 11: 10123
design of multi-purpose gas, 11: 4328
efficiency for air cleaning, 11: 8837
performance and design for concentrating U ores, 11: 2346
performance for beneficiating western phosphate ores, 11: 2347
sodium hydroxide, for removal of NO_2 from dissolver off-gases, 11: 7411

SCRUP Process
See Purex Process.

Sea water
analysis for U, 11: 3343(J)
contamination with fission products, effects on marine organisms, 11: 6224(J), 6225(J)
corrosive effects on Li–Mg alloys, 11: 319
disposal of radioactive waste in the oceans, 11: 1026
distribution of Sr^{90} in North Atlantic, 11: 9960(J)
geochemistry of Th isotopes in, 11: 4870(J)
mixing rates studied by tritium content, 11: 2220
radiometric analysis for Au, 11: 11094(J)
radiometric analysis of, collected near Bikini and Eniwetok Atolls following Operation Redwing, 11: 5965
radiometric analysis of Pacific Ocean, after Castle Operation, 11: 878
sedimentation of radioactive and stable heavy nuclides in, 11: 10356(J)
uranium content in Baltic Sea, 11: 4869(J)

Sealing materials
leak plugging of stress corrosion cracks in stainless steel by, 11: 13089

Seals and glands
(See also Gaskets; Vacuum seals.)
cylinder assembly for use in pumps with high pressure differential, 11: 7014(P)
design and operation of freeze, for valves and pumps, 11: 13516(J)
design and performance of frozen, 11: 4847
design and testing, 11: 11745(R)
design for liquid-Na pipes, 11: 8688(R)
development, to control gas leakage in SIR, 11: 11788
drying system for EBWR, 11: 6106(J)
evaluation of freeze seal for S2G stop valve, 11: 3553
fluorothene valve diaphragms, testing, 11: 8552
Labyrinth type, effectiveness for Na vapor, 11: 13716
leakage of air through labyrinth seals, 11: 3781
for liquid metals, testing, 11: 11746(R)
manual for gaseous diffusion plant, 11: 12442
materials, radiation testing of rubbers for, 11: 6674
materials for, design, testing, and wear resistance, 11: 6321
metallizing for vacuum-tight bond and test specifications, 11: 2474

Seals and glands (cont'd)

performance of, for EBR systems, 11: 6521(R)

stress corrosion in HRT mockup, 11: 9288

stresses in welds, 11: 12720

testing, for electric wiring in HRT, 11: 7859(R)

testing of liquid Na and H_2O, 11: 13868(R)

wear resistance at high temperature and rubbing speeds, 11: 5896

welding and testing, 11: 6737

Sebacic acid, bis [2-ethyl(hexyl)] esters

radiation effects, 11: 12984

Sedimentary deposits

comparison of pebbles of, from the Shinarump and Mossback members of the Chinle formation, 11: 10543(J)

Sedimentary deposits (Calif.)

occurrence in Green Velvet Claims, 11: 7191

Sedimentary deposits (Nev.)

occurrence in Panaca Area, 11: 3403

Sedimentary deposits (U. S.)

exploration, 11: 6356(R)

Sedimentary deposits (Wyo.)

occurrence in Busfield claims, 11: 4862

occurrence in Deadwood Formation in Bald Mountain Area, 11: 5316

Sedimentation

aging of deep sea, measurement by Be^{10} method, 11: 13366(J)

measurement in liquid metal slurries, 11: 4822

of radioactive and stable heavy nuclides in ocean waters, 11: 10356(J)

Sediments

See Silts.

Seed

mutations produced in wheat following irradiation, 11: 1399

radiation effects, influence of fractionated dose, 11: 7914(J)

radioinduced cytogenetic changes in dormant tomato, 11: 13237(J)

radiosensitivity, influence of cysteine treatment, 11: 5741(J)

radiosensitivity of oat, in different phases of ontogenetic development, 11: 5162(J)

Seedlings

grown from irradiated seed, endogenous respiration in, 11: 1740(J)

radiation effects on growth, 11: 5716(J)

radiosensitivity, 11: 12642(R)

Segregation

See Phase studies.

Selenides

(See also Cadmium selenides; Copper selenides; Hydrogen selenides; Plutonium selenides; Uranium selenides.)

heat, free energy, and entropy of Se^{2-}, 11: 7934

radiation effects on organic, 11: 11469

Selenium

neutron total cross sections, 11: 10229

neutron total cross sections, fast, 11: 2085(J)

Selenium hydrides

See Hydrogen selenides.

Selenium isotopes

evidence for light neutron-deficient, 11: 4556(J)

Selenium isotopes Se^{71}

formation and properties, 11: 13451(J)

Selenium isotopes Se^{76}

energy levels, mixing ratios of $2+ \rightarrow 2+$ transitions, 11: 12203(J)

Selenium isotopes Se^{77}

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

Selenium isotopes Se^{81}

difference in behavior of isomers of, following neutron capture, 11: 12861(J)

Selenium isotopes Se^{82}

gamma reactions (γ,n), 11: 5041(J)

Selenium isotopes Se^{83}

gamma spectra, 11: 11740(R)

Selenium–silver systems

standard free energy of formation of Ag_2Se, 11: 6236

Self-diffusion

in liquid systems, 11: 7088(R)

in metals, measurement of coefficients, 11: 11235(J)

Semiconductors

(See also Electric conductivity.)

conduction, chemical bonds, and heat transfer, 11: 1769(J)

Coulomb field shielding by free charges in, 11: 8244(J)

detection of positive ions using, 11: 9771(R)

impurity levels, shallow electronic energy states associated with, 11: 3014(J)

irradiation, formation of batteries by, 11: 4777(P)

properties of containing sphalerite and wurthite, review, 11: 8036(J)

radiation damage observed by ultrasonic attenuation and velocity measurements, 11: 762

radiation effects, 11: 765(J), 1922(R), 5668(J), 11469, 12627

radiation effects on fast neutron, 11: 9771(R)

radiation effects on crystal diodes, gamma, 11: 3206

radiation effects on Hall coefficient, 11: 4738

radiation effects on performance, short duration neutron, 11: 12723

Sentinel Peak Quadrangle (Colo.)

preliminary geologic map of, 11: 12040(J)

Separation processes

(See also specific processes, e.g., Purex Process.)

analytical control, solvent extraction apparatus for U, 11: 8324

Analytical Control Laboratory operating manual for ICPP, 11: 8856

chemical, properties of materials encountered in, 11: 5184

chemical stability of iron sulfamate in process solutions, 11: 7525

closed-cycle beta process, 11: 12408

cost factors for fuel recycling for 10 power reactors, 11: 6890

decontamination of equipment, 11: 5204(J)

determination of organic acids in, 11: 8291

development and waste handling, 11: 1026

development at ORNL, 11: 13648(R), 13649(R), 13650(R), 13651(R), 13654(R), 13658(R), 13662(R)

development for separation of Pu and U from fission products, 11: 8867

development for UO_3–H_3PO_4–H_2O system, 11: 1837

Separation processes (cont'd)
development for U recovery from MgF_2 slags, 11: 5267(J)
diffusional, improvement by application of mechanical energy, 11: 10039(J)
direct plant maintenance, practicality, 11: 194(J)
evaluation of ion exchange and solvent extraction, 11: 12330(R)
flowsheets for Pu recovery from spent reactor fuel, 11: 8868
flowsheets for processes used in Union of South Africa, 11: 6316(J)
flowsheet for single-region thermal breeder reactor, 11: 5604(J)
health physics aspects for SPRU process, 11: 13673
for homogeneous reactor solutions, underflow pot cooling system, 11: 3753
ion exchange, for U isotope separation, 11: 7704
mass transfer in, review, 11: 5373
for metal solutions, 11: 12970(R)
metallex and thorex problems, 11: 9619
nitric acid recovery from raffinates, 11: 191(J)
pilot plant testing of solvent extraction of acid RIP pregnant eluates, 11: 10481
pilot plants for fission product separation with a precipitator-column, 11: 7138
power reactor fuel processing status report, 11: 7513(R)
for processing homogeneous reactor fuels, survey, 11: 11603
radiation hazards and control, 11: 3296
radiochemical separation procedures for Ba, Ca, Sr, Ag, and In, 11: 1475(R)
in reactor fuel chemical processing, 11: 683(J)
for recovery of spent homogeneous thermal breeder reactor fuels, 11: 11609
review of ion-exchange, 11: 5272(J)
review of liquid-extraction, 11: 5273(J)
solvent extraction, volatility, and pyrometallurgical, for U, 11: 5268(J)
statistical methods, 11: 7094(J)
survey for irradiated fuels, 11: 3367(J)
tank design for, nuclear safety, 11: 184
for U and Pu from irradiated fuels, 11: 6314(J)
for uranium isotopes, application of separation nozzle, 11: 1024(J)
uses of mathematics, computers, statistics, and automation, review, 11: 5433(J)
waste disposal, 11: 9283

Separation processes conferences
Belgian symposium on chemical processing, 11: 12701
plutonium chemistry in Purex Process, ORNL, Jan. 1950, 11: 11600

Separators
See Cyclone separators; Wire-mesh entrainment separators.

Serums
(See also Blood serum.)
enzymatic activity of desoxyribonuclease in irradiated dog, method of measurement, 11: 9196(J)

Servomechanisms
(See also Cybernetics; Laboratory equipment; Reactor control rods; Remote-control equipment.)
amplifying devices and control systems, 11: 459
for control of Brookhaven Reactor, design, 11: 2713
design and operation of reluctance motor drive coupled to control rods, 11: 13991

Servomechanisms (cont'd)
design criteria for relay with 2 integrating elements, 11: 9375(J)
for drift stabilization in wide band d-c amplifiers, 11: 2566
relay, analysis of third-order, 11: 9371
temperature control, for ARE, 11: 13130

Sewage
(See also Waste disposal; Waste processing.)
use of radioisotopes in tracing, into the sea and coastal waters, 11: 11906(J)
radioinduced destruction of microörganisms in, 11: 4236(J)

Sewage systems
radioactive tracer study, in Santa Monica Bay, 11: 6628(J)

Sex hormones
See Gonadal hormones.

SF materials accounting
(Accounting of source and fissionable materials.)
in exponential studies with Pu^{239}, 11: 8546
manual of chemical procedures for, 11: 12342
problems, applications of mathematical theory of the "analysis of variance" to, 11: 193(J)
procedures of AEC and contractors, 11: 1
for 25 Process runs on MTR elements, 11: 11601

SFR
See Submarine Fleet Reactor.

Shadow shielding
See Gamma shielding.

Shadowgraph photography
See Spark shadowgraph photography.

Shale deposits
uranium distribution in, of Mont., N. Dak., Utah, Idaho, and Oreg., 11: 3409(J)

Shale deposits (Tenn.)
occurrence in Youngs Bend Area in Eastern Highland Rim, 11: 3406

Shales
(See also Bituminous shales; Black shales; Carbonaceous shales; Oil shales.)
analysis, mineralogy, and petrology of U-bearing, 11: 7190(R)
leaching and roasting for U recovery, 11: 2305(R), 2311(R), 2313(R), 2314(R), 2315(R), 2320(R), 2381(R), 2382
radiometric analysis for U with β counter, 11: 13603

Sheep
radiosensitivity, 11: 9950(J)
surgical thyroidectomy procedure, 11: 9190(J)

Sheets
(See also Films; Foils; Plates; Reactor fuel sheets.)
residual stress in, graphical method, 11: 10566

Shell Development Co., Emeryville, Calif.
progress reports, 11: 9211(R), 11958(R)
progress reports on engine oil development, 11: 6710(R), 11156(R), 11158(R)
progress reports on grease lubrication, 11: 1184(R)
progress reports on high temperature bearing lubrication in absence of liquid lubricants, 11: 12668(R)
progress reports on the stability of jet engine fuels, 11: 6282(J), 11157(R)

Shell nuclear models
See Nuclear models (shell).

Shells (geometry)

buckling, 11: 11152

buckling of shallow spherical, under external pressure, 11: 6420

mechanical properties, bibliographies, 11: 10511

stress analysis, theory, 11: 2936

thermal expansion stresses in clad spherical, 11: 8559

thermal stresses in spherical, mathematical analysis, 11: 8560

Shelters

(See also Structures.)

atomic explosion noise effects on mice in blast-resistant, 11: 9906

design specifications for civilian defense, 11: 4218

evaluation of personnel protection against atomic explosions, 11: 7922

shielding properties of underground, 11: 12652

Sherwood Project

(See also Thermonuclear reactors.)

status summary, 11: 6758(J)

Shield ducts

See Reactor shield voids.

Shield Testing Reactor

See Bulk Shielding Facility.

Shield voids

See Reactor shield voids.

Shielded containers

design for shipping APPR fuel element test samples, 11: 12569

HRT sample carrier dosage calculations, 11: 4668

portable, for radioactive source, 11: 7396(P)

shielding requirements for shipment of metallurgical samples, 11: 6160

thickness calculations for, for APPR-1, 11: 8231

Shielding

(See also main headings by name of radiation shielded, e.g., Gamma shielding. See also Reactor shielding.)

against nuclear radiation, general discussion, 11: 6969(J)

conference preceedings, Naval Radiological Defense Lab., Oct., 1956, 11: 10365

design, effect of flow pattern on, 11: 1704(J)

design, materials, and theory, 11: 2131(J)

design for HRT charcoal pit and gas line, 11: 6891

design for Saclay hot labs, 11: 792(J)

design using alternate layers of iron and cellulose acetate containing boron, 11: 11538(P)

development program at NDA, outline of, 11: 5676

effect of distance from coolant pipes on weight, 11: 2196

effectiveness as protection to ground crew working on radioactive jet engine systems panel, 11: 10174

heat generation in thermal, by γ rays, 11: 4012

heat removal from ionization chamber, 11: 8749

integral network methods of treating problems, 11: 5677

leakage enhancement by internal voids, 11: 13216

mathematical analysis, 11: 8230

radiation, book, 11: 11485(J)

radiation from a plane circular source, 11: 791(J)

radiography procedure for acceptance test, 11: 12452

radiosensitivity effects on rats, 11: 830(R)

Shielding (cont'd)

self, by poisons in inhomogeneous mixtures, 11: 1382(J)

theory, series for F-functions in, 11: 3214(J)

Shielding materials

(See also specific materials.)

boron dispersed in methyl methacrylate polymer, 11: 11537(P)

boron steels for, fabrication and testing, 11: 11003

chemical and physical properties of concrete aggregates, 11: 2764

concrete, diffusion length of thermal neutrons, 11: 789

engineering properties of high-density concretes, 11: 9892

gamma absorption in, energy from, 11: 1618(R)

gamma and neutron attenuation, 11: 11821

liquids containing pellets for γ and neutron shielding, properties, 11: 2767

measurement of thermal stress in reinforced concrete slabs, 11: 13554

neutron penetration through non-hydrogenous, analysis, 11: 8750

for neutrons, survey, 11: 13218

preparation, 11: 2766

radiation effects on plastic laminate, 11: 4741

use of concrete as, 11: 12942(J)

Shims

See Accelerators; Reactor control rods.

Shinarump Formation

stratigraphy of, in upper triassic strata in southeastern Utah, 11: 6723(J)

Shinarump member (Utah)

comparison of pebbles of, and Mossback member of the Chinle formation, 11: 10543(J)

Ship Inboard Reactor

See Submarine Intermediate Reactor.

Shipboard Intermediate Reactor

See Submarine Intermediate Reactor.

Shippingport Pressurized Water Reactor

blanket rod reference design, 11: 10991

blanket subassembly tube for, 11: 2125

breeder elements, fabrication and radiation effects, 11: 9108

cleaning, removal of perclene solvent from blind access holes, 11: 12565

comparison with the Calder Hall Reactor, 11: 6068, 9131(J)

container air activity, 11: 13509

contamination, effect of surface finish on, 11: 8711

control rod materials, 11: 12244, 12245

control rods and core structure, proposals concerning design, 11: 11810

coolant, feasibility of using high pH water, 11: 12243

coolant activity, effect of leakage into boiler water, 11: 11435

coolant activity level, 11: 13509

coolant analysis system, 11: 8179

coolant flow, means to prolong coastdown, 11: 12902

coolant flow distribution in core-1, 11: 12612

coolant flow in thermal-shield passages, model studies, 11: 10723

coolant mixing studies, 11: 5574

cooling system, calculated deposited crud activity, 11: 11433

Shippingport Pressurized Water Reactor (cont'd)
cooling system, $LiOH \cdot H_2O$ for pH control, 11: 11811
corrosion of Zircaloy cladding of bent fuel rod, proposed test for effect of heat, 11: 10983
creep and rupture of water-logged fuel rods, 11: 14007
decontamination, high-temperature stability of solutions for, 11: 11430
decontamination, procedures for chemical, 11: 11431
decontamination of cooling loop, evaluation of feed-and-bleed method, 11: 11432
design, specifications, fuel element fabrication, criticality studies and transients, 11: 11808(R)
design and development, 11: 6909(R), 9109(R), 10988(R), 11806(R), 12608(R)
design of, 11: 4112(J), 6068
development status, 11: 10737(R)
fission gas pressures in fuel rods and elements, 11: 11812
fuel element cleaning specification, 11: 12520
fuel element defect assemblies, 11: 10984
fuel element end closure welds, determination of cause and means of preventing porosity, 11: 10902
fuel element fabrication, 11: 12472, 13997
fuel element fabrication, UO_2–Zr clad, 11: 9714
fuel element testing, fission product release from defect, 11: 7331
fuel element testing, in-pile, 11: 8721
fuel elements, fission product release in, 11: 7384
fuel rod bundle design, selection of welded, 11: 9878
fuel rod corrosion by 650°F degassed water, 11: 13758
fuel rod evaluation, 11: 14000
fuel rod extrusion cladding, 11: 13809
fuel rod fabrication, UO_2 compaction specification, 11: 13998
fuel rod fabrication by extrusion of multifil billets, compartmented, 11: 13757
fuel rod fabrication for testing, 11: 13816
fuel rod radiographic inspection, 11: 10071
fuel rods, effects of methane in, 11: 14009
gamma radiation levels from deposited fission products in the primary system, 11: 12611
leak testing of fuel rods and fuel rod bundles, 11: 12609
loop flows, simulator study, 11: 13994
operating procedures, 12: 2525
pressure vessel construction for, 11: 5038(J)
primary coolant volume surge analysis, 11: 10989
reactor simulator studies of plant performance, 11: 13993
safety, 11: 10295
safety, efficiency of filters for removal of I^{131} from plant air, 11: 11038
startup from cold and scrammed conditions, 11: 13996
thermal and hydraulic design parameters, fuel rod design, and reactivity, 11: 10986(R)
tritium hazard resulting from use of LiOH in cooling system, 11: 12610
waste disposal equipment for power plant, specification, 11: 11667
waste disposal facilities, 11: 6712(J)
waste disposal system, 11: 12023

Ships
See Merchant vessels; Naval vessels.

Shock
physiological effects on laboratory animals compared with effects of irradiation, 11: 7047(J)

Shock tubes
bibliographies on design, construction, and applications, 11: 4411
flow in, high temperatures and high speed applications, 11: 8035(J)
optical shock velocity measuring system for, 11: 10110
shock strengths in, measurement and factors affecting, 11: 13378

Shock waves
(See also Atomic explosions; Detonation waves; Explosions; Thermonuclear explosions.)
bibliographies on formation, propagation, and measurements, 11: 4411
in blasts approaching spherical, 11: 3902(J)
calculations for propagation of, over an obstruction in a channel, 11: 479(R)
in gases, effects of magnetic fields, 11: 6746
impact tests in plastic compressible media, theoretical analysis, 11: 1055(J)
mathematical analysis of converging, 11: 13384
measurement, 11: 13565(R)
measurement, pressure gage design for, 11: 2578
one-dimensional, exact and approximate treatments of, 11: 1921
optical shock velocity measuring system, 11: 10110
point-source blast in gas, front parameters, 11: 3903(J)
propagation following blast in heat conducting gas, mathematical analysis, 11: 10064(J)
propagation in curved channel, 11: 383
propagation in homogeneous medium, 11: 4495(J)
propagation of, from strong peripheral explosions, 11: 7215(J)
propagation through inhomogeneous atmosphere, machine calculation program for, 11: 2539
propagation through water, 11: 6648(J)
properties, effects of ionization and dissociation on, mathematical analysis, 11: 1921
structure of shock front in argon, 11: 5939(J)
velocities in various liquids determined by photographic method, 11: 6647(J)

Shutters
See Cameras.

Sickle cells
See Anemia; Erythrocytes.

Sicklemia
See Anemia.

Sickness
See Radiation sickness.

Sieves
See Screens.

Sigma piles
design and neutron flux measurements, 11: 2691
exponential measurements in D_2O systems, 11: 13517(J)
lattice parameters, 11: 8573
neutron attenuation calculations, 11: 2716
neutron diffusion, 11: 8671
neutron diffusion length in graphite, 11: 13618

Silanes
polymerization and preparation, 11: 9985

Silanes (cont'd)

preparation and polymerization of diphenylvinyl-, 11: 3768(R)

synthesis, 11: 7694(R), 11057(R)

synthesis of phenylmethylchlorofluoro- and phenylmethylfluoroethoxy-, 11: 12712(R)

Silica
See Silicon oxides.

Silicane
See Silanes.

Silicate rocks

(See also Rocks.)

separation of Li from, 11: 9527(P)

spectrophotometric analysis for Th using iodate precipitation, 11: 6263(J)

Silicates

(See also Uranyl silicates.)

analysis for fluorides, 11: 3351(J)

coloration and luminescence, 11: 5376(J)

formation by reaction in solid state, tracer study, 11: 87(J)

Silicic acids

micro-analysis, 11: 111(J)

solubility in TBP–kerosene–U nitrate systems, 11: 10808

Silicide coatings

deposition on U, Mo, and steels, 11: 4464(R)

Silicides

(See also specific silicides.)

crystal structure of, of Ti, Zr, V, Nb, Ta, Cr, Mo, and W, 11: 3390

Silicon

activation determination, 11: 8296(R)

corrosion of Be affected by, 11: 7680

dislocations, band structure, transport properties, and impurity levels, 11: 4499(J)

electrical and optical properties of, for use in solar batteries, 11: 801(J)

gravimetric and colorimetric determination in Ti and Ti alloys, 11: 7114(J)

heat of fusion, 11: 4855

magnetic susceptibility vs temperature, 11: 1922(R)

neutron damage in, detection by ultrasonic double refraction measurements, 11: 6154(J)

neutron reactions, effect on gas formation, 11: 3577

neutron reactions (n,p), at 14 Mev, 11: 3585(J)

neutron reactions (n,2p)Mg^{28}, (n,He^3)Mg^{28}, and (n,αp)Na^{24}, 11: 12278(J)

neutron total cross sections, 11: 1287

physiological effects, 11: 13565(R)

proton inelastic scattering at 12 Mev, 11: 4994(J)

proton scattering at 96 Mev, energy spectrum, 11: 612(J)

radiation effects and electric properties, 11: 8747(R)

scintillation characteristics, 11: 9772(R)

spectrographic determination in pitchblendes, 11: 10812(R), 12971(R)

spectrophotometric determination in ThO_2, 11: 4300(J)

spectrophotometric determination in UF_4 and MgF_2, 11: 1429(R)

synthesis of polyarylenesiloxanes, 11: 208(R)

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

Silicon–aluminum–chromium coatings
See Aluminum–chromium–silicon coatings.

Silicon–aluminum coatings
See Aluminum–silicon coatings.

Silicon–aluminum–lithium systems
See Aluminum–lithium–silicon systems.

Silicon–aluminum systems
See Aluminum–silicon systems.

Silicon–aluminum systems (liquid)
See Aluminum–silicon systems (liquid).

Silicon–aluminum–titanium systems
See Aluminum–silicon–titanium systems.

Silicon–aluminum–uranium systems
See Aluminum–silicon–uranium systems.

Silicon–beryllium systems
See Beryllium–silicon systems.

Silicon–boron–zirconium systems
See Boron–silicon–zirconium systems.

Silicon carbide–boron carbide systems
See Boron carbide–silicon carbide systems.

Silicon carbide coatings

preparation by electrophoretic deposition, 11: 8514(R)

Silicon carbide–uranium(IV) oxide systems

development as ceramic bodies for plate-type fuel elements, 11: 12457

Silicon carbides

oxidation in air up to 2300°C, 11: 6713

powder metallurgy, and application to fuel element fabrication, 11: 8464

radiation effects, 11: 8266(R), 9579(R)

radiation effects on lattice constants and density, 11: 7882

thermal conductivity measurements in air, 11: 8542

Silicon–chromium–molybdenum systems
See Chromium–molybdenum–silicon systems.

Silicon–chromium steel
See Chromium–silicon steel.

Silicon–chromium–titanium systems
See Chromium–silicon–titanium systems.

Silicon coatings

for uranium, deposition, 11: 7656(R)

Silicon–copper–molybdenum systems
See Copper–molybdenum–silicon systems.

Silicon–copper–nickel systems
See Copper–nickel–silicon systems.

Silicon crystals

radiation effects on diodes, 11: 13866(R)

single, etching behavior of irradiated, 11: 5931(J)

Silicon fluorides

hydrolysis constants and dissociation of Na_2SiF_6, 11: 8851(J)

Silicon–iron systems
See Iron–silicon systems.

Silicon–iron–titanium systems
See Iron–silicon–titanium systems.

Silicon isotopes

proton reactions (p,γ), resonances in, 11: 4134(J)

thermal neutron reactions (n,γ), 11: 711(J)

Silicon isotopes Si^{27}

half lives, graphical method for determination, 11: 12295(J)

Silicon isotopes Si^{28}

deuteron reactions, 11: 1542(R), 4716

deutron reactions (d,p γ), proton gamma angular correlations in, 11: 1353(J)

energy levels, 11: 1542(R), 1647(J), 8155(J), 9054(R), 9189(R)

neutron reactions (n,p), proton spectra, 11: 12863(J)

Silicon isotopes Si^{29}

energy levels, 11: 9054(R)

low-lying levels in, 11: 12857(J)

nuclear properties, application of collective model to, 11: 12858(J)

proton reactions (p,n), polarization of neutrons from, 11: 3015(J)

Silicon isotopes Si^{30}

neutron capture reactions in, search for successive, 11: 4978(J)

Silicon isotopes S^{31}

energy levels studied by reaction $P^{31}(p,n)S^{31}$, 11: 3047(J)

pile neutron capture cross sections, 11: 4978(J)

Silicon junctions

(See also Transistors.)

radiation effects, 11: 3597

temperature effects on transition capacity, 11: 8025(R)

Silicon–molybdenum–titanium systems
See Molybdenum–silicon–titanium systems.

Silicon oxide–aluminum oxide–calcium oxide systems (liquid)
See Aluminum oxide–calcium oxide–silicon oxide systems (liquid).

Silicon oxide–aluminum oxide–manganese oxide systems
See Aluminum oxide–manganese oxide–silicon oxide systems.

Silicon oxide–barium oxide systems
See Barium oxide–silicon oxide systems.

Silicon oxide–titanium oxide system

immiscibility and equilibrium data, 11: 6715(J)

Silicon oxide–titanium oxide–zirconium oxide systems

immiscibility and equilibrium data, 11: 6715(J)

Silicon oxide–uranium oxide systems

density, fabrication, melting point, oxidation, and thermal shock, 11: 1064

physical properties of sintered, 11: 7601

preparation and radiation effects of, and applications to reactor fuel elements, 11: 13737

Silicon oxides

compressibility of SiO_2–Li_2O system, 11: 7102(J)

polymorphic modifications of, in ceramic coatings, 11: 5858

radiation effects, 11: 7455(R), 7691(R), 8266(R), 9579(R), 13578(R)

radiation effects of deuterons on spun cloth, 11: 13204(R)

radiation effects under fast neutron irradiation, 11: 6961(J)

spectrographic and colorimetric determination in Mg, 11: 10810(R)

spectrophotometric determination in ThO_2, 11: 12973(R)

thermodynamic instability at all temperatures and entropy at 298°K, 11: 4855

Silicon oxides (colloidal)

adsorption of N from H gas streams on, at low temperatures, 11: 11989

adsorptive properties for Pu, 11: 13024(R)

recovery of spent, used in adsorption separation of Hf and Zr, 11: 8510(R)

for removal of acetylene from air, 11: 5257(J)

Silicon oxides (colloidal) (cont'd)

sorption properties, effects of chemical nature and porosity of surface on, 11: 1009(J)

sorptive and physical properties and regeneration, 11: 2365

Silicon oxides (fused)

neutron induced color center at 242 mμ, 11: 5068(J)

structure of neutron-irradiated, determined by x-ray-diffraction analysis and infrared spectroscopy, 11: 6973(J)

Silicon–oxygen–titanium systems
See Oxygen–silicon–titanium systems.

Silicon–plutonium systems
See Plutonium–silicon systems.

Silicon–silver systems (liquid)

enthalpy of formation, measurement, 11: 3427(R)

Silicon steel

metallurgy of, survey and bibliography of current literature, 11: 350(J)

Silicon–thorium systems

corrosion by boiling distilled water, 11: 7664(R)

Silicon–uranium compacts

fabrication, 11: 8717(R)

Silicon–uranium oxide compacts

physical properties of sintered, 11: 7601

Silicon–uranium systems

casting and fabrication, 11: 13766

constitution diagrams, crystal structure, fabrication, mechanical and physical properties, powder metallurgy, and thermal cycling, 11: 10871

constitutional diagrams, microstructure, mechanical properties, and x-ray-diffraction pattern, 11: 2930(J)

corrosion, 11: 7663(R), 8462(R), 11715(R)

corrosion, effects of radiation on, 11: 7630(R), 8926, 10354(J), 13820

corrosion, heat treatment and tensile properties, 11: 13042

corrosion, mechanical properties, bonding, brazing, extrusion, absorptive properties, development for PWR, 11: 1141

corrosion and interfacial reactions, 11: 7640

corrosion by boiling water, 11: 7665(R)

corrosion by degassed H_2O at 290°C, 11: 7629(R)

corrosion by water, 11: 8452, 10923(R), 13868(R)

corrosion by water at 500°F, 11: 11745(R)

corrosion by water of epsilonized, radiation effects, 11: 10887(R)

corrosion of irradiated, 11: 8926

corrosion resistance and physical properties, 11: 11716

corrosion resistance of, improvement by Mo addition, 11: 6589(P)

corrosion testing of fuel elements, 11: 10987(R)

dimensional changes in irradiated, 11: 11664

effects of radiation on corrosion-resistant, 11: 10354(J)

extruded, Al bonding for stabilization, 11: 10901

fabrication, corrosion, and heat treatment, 11: 7683(R)

fabrication and corrosion, 11: 13189(R)

fabrication techniques, 11: 10987(R), 11720

fuel element application, corrosion, and phase studies, 11: 7684

heat treatment, mechanical and physical properties, and microstructure, 11: 11695

high-temperature strength, 11: 8484(R)

inclusions, metallography, 11: 13099

Silicon–uranium systems (cont'd)
melting and remelting by vacuum induction in Be crucibles, 11: 11722
metallurgy of, for PWR, 11: 1141
phase studies, 11: 7668, 8493
radiation effects, 11: 7629(R)
radiation effects and corrosion by degassed H_2O at 290°C, 11: 7629(R)
radiation effects on dimensional stability, 11: 13820
rolling, 11: 13763(R)
thermal conductivity, 11: 8487(R)

Silicon–uranium systems (clad)
extrusion, 11: 7684

Silicon–uranium systems (Zr clad)
corrosion in high temperature H_2O and steam, 11: 13323
extrusion, 11: 13813

Silicone polymers
effects of radiation and hot pressurized H_2O, 11: 1804

Silicone rubbers
fluoro-, preparation, 11: 144(R)
radiation effects, 11: 11469

Silicones
radiation effects, 11: 5246, 12984, 12985

Siloxanes
See Silicones.

Silts
age determination by ionium method, deep sea, 11: 7999(J)
aging of deep sea, measurement by Be^{10} method, 11: 13366(J)

Silver
adsorption of I_2 on, 11: 11502(P), 13951(R)
alpha-particle scattering at 40.2 Mev, 11: 6952(J)
alpha, proton, and deuteron reactions at high energies in, absolute cross sections for production of secondary particles, 11: 4114
angular distribution of 424-Mev protons elastically scattered from, 11: 10350(J)
antiproton interactions with nuclei, 11: 11362
atomic weight, chemical determination, 11: 11096(J)
colorimetric determination in Bi, 11: 2830
corrosion products on, bibliography, 11: 12031(J)
Coulomb excitation by N ions, γ rays from, 11: 4067(J)
deposition and polarographic investigation, 11: 1435(J)
deuteron spectra from (p,d) reaction, 11: 9495(J)
diffusibility of Fe^{55}, Fe^{59}, and Cd in, 11: 11194(R)
diffusion coefficients for Kr in, radiometric analysis, 11: 10114(J)
diffusion in Cu, 11: 11194(R)
diffusion of Ar in, 11: 10585
diffusion of Cu and Hg in, 11: 3425(R)
diffusion of Fe^{59} and Fe^{55} in, isotope effect, 11: 5903(J)
diffusion of Au in single crystals, 11: 360(J)
elastic properties and damping capacity, effect of temperature on, 11: 343(J)
electrodeposition of trace quantities, 11: 12330(R)
electrodeposition on Th, 11: 13783
exchange reactions with AgCl in aqueous solutions, 11: 1764

Silver (cont'd)
gamma-ray yields from resonant capture of slow neutrons, 11: 4987(J)
gamma reactions (γ,n), 11: 704(J)
gamma reactions (γ,π^0), 11: 4115
gamma spectra, 11: 11739(R)
high-temperature corrosion by NaOH, 11: 5312
K fluorescence yield, 11: 5545(J)
meson (π^-) activation of, yields of Pd, Rh, and Ru isotopes from, 11: 3022(J)
multiple scattering of 0.4-Mev electrons and positrons by, 11: 5398(J)
neutron activation cross sections, 11: 1980
neutron emission following μ-meson capture, 11: 9138
neutron energy levels, 11: 10232(R)
neutron resonance widths, 11: 7292(R)
neutron resonances, 11: 607(J)
neutron total cross sections and resonances in kev region, 11: 4047(J)
nuclear evaporation induced by cosmic rays in, studied with emulsion sandwich, 11: 3530(J)
polarographic–amperometric determination, 11: 9234(J)
proton energy loss in, 11: 4016(R)
proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)
proton ranges in, from 6 to 18 Mev, 11: 6142(J)
proton reactions at 5.7 Bev, Li^8 emission from, 11: 5624(J)
proton reactions (p,π^+) at 340 Mev, 11: 5989(J)
proton scattering at 96 Mev by, energy spectrum, 11: 612(J)
radiochemical separation by electrolysis and precipitation, 11: 5250
radiochemical separation from fission products, 11: 180
scattering of fast electrons, 11: 756(J)
self-diffusion, 11: 8547(R)
self-diffusion coefficients, measurement, 11: 11235(J)
slow-neutron resonance scattering, 11: 3046(J)
solubility in saturated water, effects of radiation, 11: 2237(R)
solutions, effects of atomic hydrogen on, 11: 11076(J)
spectra, Nevis cyclotron analysis, 11: 10244
thermodynamic properties of Ag and Ag_2, 11: 11218
vacancy formation, energy of, 11: 11234(J)
wettability of carbon steel with, 11: 377(J)

Silver alloys
corrosion by water, 11: 12753
tensile properties, 11: 12753
tensile properties and corrosion, 11: 12244, 12245

Silver–aluminum alloys
See Aluminum–silver alloys.

Silver–cadmium alloys
See Cadmium–silver alloys.

Silver–cadmium–indium alloys
See Cadmium–indium–silver alloys.

Silver chlorides
chronopotentiometric determination in LiCl–KCl systems at 450°C, 11: 2834(J)
dissolution in fused KCl, polarographic behavior, 11: 1435(J)
exchange reactions with Ag in aqueous solutions, 11: 1764
phase studies of stratified structure in fused, 11: 382(J)

Silver–chromium–uranium alloys
See Chromium–silver–uranium alloys.

Silver coatings
preparation by electrophoretic deposition, 11: 8514(R)

Silver complexes
with nitrosonaphthol, formation constants, 11: 4301(J)

Silver–copper alloys (liquid)
See Copper–silver alloys (liquid).

Silver Creek Area (N. C.)
geophysical exploration, geology, and mineralogy, and monazite reserves, 11: 3404

Silver electrodes
resistance polarization as distinguished from other types of polarization, 11: 4494(J)

Silver films
passage of H^+, He^+, C^+, and O^+ through, energy loss measurements, 11: 10145(J)

Silver fluoborates
preparation, 11: 12683(J)

Silver–germanium alloys
See Germanium–silver alloys.

Silver–gold alloys
See Gold–silver alloys.

Silver–gold couples
See Gold–silver couples.

Silver halide crystals
electric conductivity, measurement of, 11: 13368(J)

Silver halides
electromotive forces of thermochains, 11: 5194(J)
lattice defects, origin and properties of, 11: 4912(J)

Silver–indium alloys
See Indium–silver alloys.

Silver iodides
adsorption of flotation reagents, 11: 3784

Silver isotopes
cross sections for Cd(n,p)Ag reactions with neutrons at 14 Mev, 11: 10250(J)
energy levels, 11: 10686(R)
energy levels from time-of-flight spectra, 11: 10229

Silver isotopes Ag^{107}
energy levels, 11: 12186(R)
energy levels from proton scattering data, 11: 9186(R)
neutron reactions (n,2n), cross sections, 11: 9140(J)

Silver isotopes Ag^{109}
energy levels, 11: 12186(R)
energy levels from proton scattering data, 11: 9186(R)
neutron reactions (n,2n), cross sections, 11: 9140(J)

Silver isotopes Ag^{110}
angular correlation measurement of γ rays from disintegration, 11: 13448(J)
decay schemes, 11: 9161
half life, 11: 6054(J)

Silver isotopes Ag^{111}
decay properties of 74-second isomer, 11: 6158(J)

Silver isotopes Ag^{111} (cont'd)
decay scheme for, 11: 7405(R)
nuclear spin and hyperfine structure separation of ground state, 11: 618(J)

Silver King Claims (Utah)
geophysical exploration and U occurrence, 11: 6355

Silver–nickel alloys (liquid)
See Nickel–silver alloys (liquid).

Silver nitrate–sodium nitrate systems (liquid)
transport numbers and structures in, 11: 6248(J)

Silver nitrates
crystal structure and x-ray measurements of thermal expansion, 11: 1206(J)

Silver oxides
use in nuclear battery as high work function surface, 11: 448(R)

Silver–selenium systems
See Selenium–silver systems.

Silver–silicon systems (liquid)
See Silicon–silver systems (liquid).

Silver sulfates
solubility, 11: 9863(R)
solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)
solubility in electrolytes, 11: 6642(J)
solubility in H_2SO_4, 11: 11576(R)

Silver sulfides
adsorptive properties, electrochemical studies, 11: 4861(R), 6237(R)

Silver–tellurium systems
thermodynamic properties, 11: 6236

Silver–thallium alloys
self-diffusion in solid solutions, 11: 10564

Silver–tin alloys
life expectancy of solder plugs of, 11: 8689(R)

Silver tungstates
phase studies of fused, stratified structure in, 11: 382(J)

Silver–zirconium alloys
constitution diagrams, determination of, 11: 12055
phase studies, 11: 12456(R)
thermodynamic properties, 11: 10563

Simulators
See Computers; Reactor simulators.

Single crystals
(See also main headings by name of materials, e.g., Copper crystals.)
color centers in, 11: 7405(R)
diffraction measurements, high speed computation of absorption correction, 11: 5930(J)
lattice parameter measurements, 11: 5798
optical properties and color centers in, 11: 8266(R)

Sintering
equipment, schematic diagram of, 11: 6410(J)
equipment for direct resistance, 11: 6409(J)
mechanism in pure oxides and metals, 11: 6390(R)

Sintering (cont'd)
shrinkage measurements during, of powder pressings, 11: 4550(J)

Siphons
starting device, 11: 5237

SIR
See Submarine Intermediate Reactor.

Skeleton
(See also Bones.)
radioactivity induced in, by natural and artificial sources, 11: 12639(R)
strontium^{90} level in growing children, 11: 11909(J)

Skin
burns of, effectiveness of protective ointments, 11: 835
decontamination by applying plastic coating and then pulling it off, 11: 11877(R)
decontamination by iontophoresis, 11: 2797(J)
decontamination of human, after immersion in plutonium solution, 11: 11037
effects of fall-out from thermonuclear explosions, 11: 834
pathological anatomic response in radiation injured animals, 11: 3660(J)
pathological effects of β particles in fall-out from thermonuclear explosions, 11: 832
radiation dosage determination from fall-out, 11: 10178
radiation dosage determinations, 11: 4567
radiation effects, 11: 3661(J)
radioinduced pigmentation, 11: 7910(R)
radioinduced pigmentation in mice, 11: 12642(R)
radiosensitivity of mouse, 11: 7053(J)
therapeutic application of ligatures in radioinduced ulcers, 11: 3663(J)
thermal radiation effects on porcine, exposure scale, 11: 5137
thermal radiation protection by clothing, mathematical analysis and simulated experiment, 11: 7065

Skin grafting
effects of total-body irradiation on results following, in mice, 11: 35(J)

Slags
concentration for greater U recovery, 11: 13594
electrolysis of MnO–FeO–SiO, 11: 3441(R)
physical properties of magnesium fluoride, 11: 1825
separation and determination of U in, Fluoride Volatility Process for, 11: 8426
uranium recovery by fluoride volatility processing, 11: 9253, 13655
uranium recovery by ion exchange, 11: 11612
uranium recovery from, 11: 1478(R), 1482(R), 7407(R), 11564(R), 12394(R), 13038
uranium recovery from, flowsheets, 11: 9700
uranium recovery from, UAP Process for, 11: 5267(J)
uranium recovery from electric furnace production of P, 11: 2857
viscosity of $MnO-Al_2O_3-SiO_2$, 11: 7988(J)

SLEEP Reactor
characteristics, 11: 682(J)
reactivity measurements on subcritical, 11: 4103(J)

Slim Buttes Area (S. Dak.)
location of lignite mines and prospects in, 11: 4434
uranium occurrence in lignites in Harding Co., 11: 1082

Slimes
See Phosphate slimes; Uranium ore slimes.

Slow neutrons
(See Thermal neutrons.)

Slug canning
(See also Radiation target cans; Slug cans; Slug coatings; Slug elements; Slugs.)
arc welding in argon atmosphere, 11: 3836
bonding sleeves to cores, 11: 3231(P)
closures, consumable electrode welding, 11: 7193
closures, welding techniques, 11: 7822
development of methods for, 11: 11705
development of procedures for, at BNL, 11: 3063
hot dipping in Mg, 11: 9737(R)
prefabricated Al–Si caps, testing and evaluation, 11: 3417
procedures and equipment for, with a Schloemann cable-cladding press, 11: 12230
weld rejects, causes, 11: 2687

Slug canning (U compacts)
hot pressed hydride powder, 11: 12499(R)

Slug cans
(See also Radiation target cans; Slug canning; Slug elements.)
caustic etching for study of quality, 11: 12476
corrosion under Hanford reactor conditions, 11: 7605
prefabricated Al–Si caps, testing and evaluation, 11: 3417
temperatures on surface of, 11: 13983
testing for effect of outgassing, 11: 7658(R)
welding by consumable electrode technique, 11: 7193

Slug coatings
(See also Slug canning; Slug jackets.)
bonding of Al with Al–Si, 11: 13788(R)
corrosion of electroplated Ni, Ni–Cu, Ni–Cr, and Ni–Mo, 11: 7661
diffusion of Ni, Ni–Cu, Ni–Cr, and Mo–Ni, 11: 7661
electrodeposition, 11: 11657(R)
electrodeposition of Ni, Ni–Cu, Ni–Cr, and Ni–Mo, 11: 7661
removal, method for waste loss reduction, 11: 11622(R)

Slug coatings (Al–Si)
die casting of, feasibility studies of, 11: 13736

Slug coatings (Mo)
coating techniques, 11: 13789(R)

Slug coatings (Ni)
materials cost for plating, 11: 2688

Slug elements
(See also Long cartridges; Reactor fuel elements; Reactor slurries; Reactor solutions; Slug canning; Slug cans; Slug coatings; Slug jackets; Slugs.)
aluminum canning, Al–Si bonding, and testing, 11: 7766
blister detection in Hanford reactors, 11: 8662
blistering and rupture in ORNL Graphite Reactor, 11: 7749
bond defect detection, sonic detector for, 11: 7697
coating removal, method for waste loss reduction, 11: 11622(R)
coating removal by sodium hydroxide wash, 11: 11699
corrosion, and test equipment for corrosion studies of, 11: 13864(R)
decladding and disassembly, mechanical, 11: 11053(R)
diameter measurements following prolonged heat treatment, 11: 8499

Slug elements (cont'd)
dissolution by nitric acid and nitrogen oxide recovery, 11: 7417(R)
dissolver for, theory and design equations for, 11: 8351
effects of non-axial loads on structure of, 11: 13152
fabrication from depleted U, 11: 8500
film sampling apparatus for irradiated, design, 11: 8501
handling irradiated, equipment for, 11: 14031(R)
heat transfer from slug to jacket, effect of thermal cycling on, 11: 7816
leak detector for, using He pressure, 11: 5114(P)
manufacture of U–Zr alloy, 11: 11687(R)
neutron resonance capture in Hanford, 11: 2681
non-destructive testing, 11: 11714
non-destructive testing for internal defects, 11: 11713
prefabricated Al–Si caps, testing and evaluation, 11: 3417
radiation effects on dimensional stability of, produced by powder metallurgy, 11: 13141
radiographic inspection, automatic, 11: 11299
reactivity gains in NRX irradiated, 11: 3571(J)
rinsing system modification, 11: 11409
rupture, effect on water heating, 11: 13922
rupture detection, 11: 3491(J)
rupture in ORNL Graphite Reactor, 11: 7855
spectral hardening correction to η, 11: 2683
temperature distribution in hollow, 11: 7824
temperature relationship between center of slug and end of jacket, 11: 13888
testing, method of internal heating for, 11: 8447
thermal cycling effect on heat transfer from slug to jacket, 11: 7816
thermal stress calculations, 11: 3072, 4684
thermal testing, 11: 13883(R)
thorium carbonate, canning, 11: 7682(R)
vibration in process tubes, effects on coolant flow, 11: 8666
visual inspection of, plaster of Paris replicas for use in, 11: 7721
warp, effect of coolant temperature, 11: 13922
welding, 11: 2687

Slug elements (Al–U)
dissolution, 11: 11085
dissolution by nitric acid, 11: 7648
heat testing, 11: 8484(R)

Slug elements (Al–U^{235})
fabrication, 11: 8476

Slug elements (ceramic)
temperature calculations for UO_2 tolerance experiment, 11: 4845

Slug elements (enriched)
criticality studies in water and handling, 11: 8669
production at FMPC for North American, 11: 13791

Slug elements (Th)
dissolution of Al-canned, 11: 7409
irradiation in MTR, 11: 12625

Slug elements (ThO_2)
dissolution for determining U^{233}/Th ratio, 11: 7437

Slug elements (UO_2)
failure in pressurized water reactors, 11: 8713

Slug handling
manipulator for, in the viewing basin, 11: 2572
for Thorex Process pilot plant, 11: 8344

Slug jackets
bonding to Al–Si, expendable steel sleeves for aiding, 11: 7660(R)
materials, evaluation of Al, Al–Mg, Zr, 347 stainless steel, and Zircaloy-2 as, 11: 11193
materials, stabilization, 11: 7628
metallographic analysis of stainless steel tubing for, 11: 7848(R)
removal, 11: 12993(R)

Slugs
(Natural uranium metal cylinders.)
contamination by salt baths, 11: 9589(R)
crack detection in, instrument for, 11: 7699
danger coefficient testing and enrichment determinations in water boiler reactors, 11: 8691(R)
design of Zr-clad U tensile specimen, 11: 2771
fluorination, mathematical analysis, 11: 8423
internal and surface defects, 11: 7579
measurement of U isotopic content, 11: 2385
mechanical properties of striated, 11: 4212
operating procedures for 105-C metal examination facility, 11: 11170
outgassing vacuum retort for U, 11: 7848(R)
prefabricated Al–Si caps, testing and evaluation, 11: 3417
protective oil coatings for, 11: 12405(R)
shearing to near finish dimensions, 11: 7549(R)
temperature measurements in an off-center annulus, 11: 13082

Slugs (Al–U)
blistering and creep, anodizing effect, 11: 8521(R)
dissolution by nitric acid, 11: 7648
fabrication, 11: 7647

Slugs (Cr–U)
radiation effects on breaking, 11: 8743

Slugs (enriched)
fabrication, operating procedures for, 11: 8498

Slugs (hollow)
buckling, effect of lattice spacing for various temperatures and enrichments, 11: 1275(R)
buckling of enriched, in light water, 11: 2116(R)
critical mass, in light water, 11: 2116(R)
fast fission effect calculations, 11: 8691(R)

Slugs (Th)
corrosion of mechanically jacketed, in H_2O, 11: 7602
dissolution in 23 Process, 11: 12393(R)
nondestructive assaying for U^{233} content in Reactivity Measurement Facility, 11: 5020
residual stresses in, 11: 3838
resonance neutron capture, 11: 8573

Slugs (ThO_2)
resonance neutron capture, 11: 8573

Slurex Process

extraction and stripping in the organic phase, 11: 8339

extraction column raffinate control, 11: 9623

extractions, use of surface-active agents to prevent emulsions in, 11: 9644

jet-mixer equipment, 11: 9643

pulse column testing, 11: 8272, 8335

pulse column testing in scrub and strip operations, 11: 12988

waste recovery studies, 11: 9629(R)

Slurries

(See also specific homogeneous reactors using slurry fuels. See also headings for the classes of slurries, e.g., Oxide slurries.)

engineering calculations for systems handling, survey, 11: 237

flow characteristics, 11: 1036

fluid motion effects on interfacial areas, 11: 1852(J)

heat transfer coefficients for flow in tubes, 11: 1035

plastic flow in pipes, 11: 238

pressure losses of, in pipes and pipeline transitions, 11: 4416

Slurry Reactor

See Homogeneous Reactor Experiment.

Small Submarine Reactor

See Submarine Reactors (SIC).

Smoke generators

(See also Aerosol generators; Stack disposal.)

design for evaluation of laboratory fume hoods, 11: 9577(R)

Smokes

dispersal, 11: 6001

dispersal, meteorological factors affecting, 11: 12838

electron microscopic examination of magnesium oxide, 11: 13264

particle size measurements, 11: 7942

Socorro Area (N. Mex.)

geophysical exploration and mineralogy, 11: 11191

Soda ash

See Sodium carbonates.

Sodium

absorption and ionization of, on hot tungsten, 11: 8022(J)

activation by a fuel element with a hole in the end closure, 11: 11747(R)

activation determination in Pb, 11: 5778

activity coefficients, 11: 9983(R)

analysis for oxygen, 11: 8290

analysis for sodium oxide, 11: 13564(R)

bearing tests in, evaluation of materials, 11: 2422

chemical, physical, and nuclear properties, 11: 5758

chemical reactions with air, 11: 6521(R)

cooling properties for fast reactors, 11: 8682

corrosion studies of heat-transfer media, 11: 13516(J)

corrosive effect on Zr and Zr alloys, 11: 1129

decomposition, 11: 4816(J)

decontamination of equipment used with, 11: 11569

determination in aqueous uranyl nitrate solutions, 11: 7440(R)

determination in muscle tissue by neutron activation analysis, 11: 4315(J)

Sodium (cont'd)

effect on self-welding of metals, 11: 7727

electron energy losses in, and its compounds, 11: 745(J)

flame photometric determination in mixtures, 11: 5796(J)

galling of stainless steel in, effect of nitriding and carburization on, 11: 2452

heat transfer in condensation of vapor up to atmospheric pressure, 11: 6707(J)

ion exchange with Ca on Dowex-50 resin, 11: 7136

live intensity distribution in positive column, 11: 10603(J)

neutron absorption and radioactivity induced in, 11: 8695

neutron activation cross sections, 11: 1980

neutron activation determination, 11: 8285(R)

neutron cross sections, 11: 10229

neutron production by μ mesons stopped in, 11: 6114(J)

neutron reactions, effect on gas formation, 11: 3577

oxidation rates at temperatures from −79 to +48°C, 11: 12456(R)

proton scattering at 96 Mev by, energy spectrum, 11: 612(J)

removal from stainless steel with NH_3 and NH_3−NH_4Cl systems, 11: 12669

removal with ethylene glycol from SIR heat transfer system, 11: 2442

self-diffusion in molten $NaNO_3$, 11: 8286(R)

self diffusion in sodium polystyrenesulfonate solutions, 11: 8284(R)

separation from Al by cation exchange, 11: 196(J)

separation from Li by extraction with dipivaloylmethane, 11: 121(J)

solvent partition between hexone and HNO_3−$Ca(NO_3)_2$ solutions, 11: 6685(J)

solvent properties for NaH, 11: 5314(J)

spectrophotometric determination in Be, 11: 10813(R)

vapor trap for, 11: 13969(R)

Sodium (liquid)

activity transfer from stainless steel in systems cooled by, 11: 3818(J)

cavitation in isothermal loop venturi, 11: 13710

chemical reaction rates with water-alcohol mixtures, 11: 13149(R)

corrosion and permeation of graphite by, 11: 9725

corrosion of metals, alloys, and refractories by, 11: 9747

corrosive effects, 11: 7664(R), 7665(R), 11807(R)

corrosive effects on brazing alloys, 11: 275(R), 4460(R), 7189(J), 7196(R)

corrosive effects on Croloy and type 347 stainless steel, 11: 5311

corrosive effects on Globeiron, stainless steels, and carbon steel, 11: 7727

corrosive effects on heat exchangers, 11: 9285

corrosive effects on Ni and stainless steel, 11: 2481(R)

corrosive effects on Pyrex and 347 stainless steel, 11: 8679(R)

corrosive effects on reactor materials, 11: 227

corrosive effects on stainless steel, 11: 3328, 11748(R)

corrosive effects on stainless steel at 1000 to 1700°F, effects of aniline, air, Mg, S, and V on, 11: 5860

corrosive effects on thermal shielding, and thermal insulating materials, 11: 7847(R)

corrosive effects on W-steel, stainless steel, and Be, 11: 3398

corrosive effects on type 347 stainless steel, 11: 12555(R)

corrosive effects on U, 11: 11745(R)

Sodium (liquid) (cont'd)
corrosive effects on Zr, 11: 4095(R), 9330
corrosive properties, 11: 7666(R)
expansion, effect of pressure and heat, 11: 2423
flow, effect on performance of swing check valves, 11: 2451
flow under reactor conditions, 11: 13968(R)
heat transfer, 11: 3383
heat transfer by, barrier material evaluation for, 11: 2438
heat transfer coefficients, 11: 13868(R).
heat transfer systems, oxygen control in, 11: 249(J)
interatomic potential function, 11: 540(J)
level probe for, 11: 11746(R)
lubricity for bearing materials, 11: 2447
moderator properties, 11: 8686(R)
neutron attenuation, 11: 11748(R)
oxide pickup at 400 and 500°C, 11: 10923(R)
performance of tungsten carbide journal bearings in, 11: 2448
pressure effects with heating, 11: 2423
properties as a reactor coolant, 11: 5832(J)
pumping, design and performance of 3000 gpm unit for, 11: 1061
purification, 11: 11746(R)
reaction with air, effect on reactor housings, 11: 670(J)
reactions with tetralin, 11: 3682
reactions with various materials in air, 11: 2251
solvent properties for He, 11: 1957
solvent properties for O_2, 11: 11060
solvent properties for Na_2O, 11: 3328, 8686(R)
transfer of carbon between dissimilar metals in contact with, 11: 8479
traps for, evaluation, 11: 3885
vapor transport mechanism, 11: 13716
wettability and corrosive effects, 11: 5758
wetting temperature of fuel element components by, 11: 4464(R)

Sodium alcholates
low-temperature heat capacity and thermodynamic properties of sodium methoxide, 11: 6231

Sodium alloys
crystal structure, 11: 1878

Sodium borates
corrosive effects on spinel and corundum refractories of liquid, 11: 7188(J)

Sodium borohydrides
heat of solution in liquid NH_3, 11: 3681
reactions with amine hydrochlorides, 11: 3326

Sodium bromide–sodium chloride systems
density, comparison of x-ray and pycnometric data, 11: 3423(R), 5370(R)

Sodium bromides
density, pycnometric and x-ray data, 11: 2823(J)

Sodium carbides
electrical conductivity and bonding, 11: 6636(J)

Sodium carbonates
conductometric determination, 11: 13019(R)
ion exchange estimation in presence of U and V, 11: 5220(J)

Sodium carbonates (cont'd)
specific heat capacity of, at high temperatures, 11: 102(J)
thermodynamic characteristics at high temperatures, 11: 101(J)

Sodium chlorates
crystal strueture from Zeeman studies, 11: 9587(R)
spectra, Zeeman effect on quadrupole, 11: 7373(J)

Sodium chloride crystals
density change produced by proton irradiation and thermal annealing, 11: 10782(J)

Sodium chloride–potassium chloride systems
See Potassium chloride–sodium chloride systems.

Sodium chloride–potassium chloride–zirconium chloride systems
See Potassium chloride–sodium chloride–zirconium chloride systems.

Sodium chloride–sodium bromide systems
See Sodium bromide–sodium chloride systems.

Sodium chloride–sodium systems
See Sodium–sodium chloride systems.

Sodium chloride–thorium(IV) chloride systems
constitution diagrams, 11: 8533
electrolysis for Th metal production, 11: 8533
preparation and electrolysis, 11: 13097(R)
preparation and electrolysis for production of Th metal, 11: 7686(R)

Sodium chloride–water systems
elution of U from resins with, 11: 994
phase studies, 11: 8029(J)

Sodium chloride–zirconium chloride systems
phase diagrams, 11: 2929(J)
phase studies, 11: 7932

Sodium chlorides
adsorptive properties for ethane, 11: 12330(R)
chromatographic separation from alkali metal halides using C_6H_5OH–CH_3OH–HCl, 11: 4630(J)
comparison of natural and synthetic, 11: 7405(R)
composition diagram of melting, 11: 1770(J)
corrosive effects of solutions on Li–Mg alloys, 11: 319
crystal structure, neutron-diffraction analysis, 11: 11574(R)
density, pycnometric and x-ray data, 11: 2823(J)
determination, a comparison of methods using the flame photometer and conductivity meter, 11: 5213
lattice parameter measurements of single crystals, 11: 5798
x-ray-induced crack formation, 11: 5809(J)

Sodium chromates
analysis for HNO_3, 11: 8292
toxic effects on salmon, 11: 11556(R)

Sodium compounds
crystal structure of $NaYF_4$ and $NaGdF_4$, 11: 12341(R)
spectrographic analysis for Cs, 11: 3340

Sodium cyanide crystals
light-scattering and color centers, 11: 4757(J)

Sodium cyanides
labeled with C^{14}, preparation and radiometric analysis, 11: 4823

Sodium diuranates
See Sodium uranates.

Sodium fluoride–beryllium fluoride–lithium fluoride systems
See Beryllium fluoride–lithium fluoride–sodium fluoride systems.

Sodium fluoride–beryllium fluoride–potassium fluoride systems
See Beryllium fluoride–potassium fluoride–sodium fluoride systems.

Sodium fluoride–beryllium fluoride systems
See Beryllium fluoride–sodium fluoride systems.

Sodium fluoride–beryllium fluoride systems (liquid)
See Beryllium fluoride–sodium fluoride systems (liquid).

Sodium fluoride complexes

with uranium hexafluoride, preparation, and properties, 11: 2378

Sodium fluoride–hydrofluoric acid systems
See Hydrofluoric acid–sodium fluoride systems.

Sodium fluoride–lithium fluoride systems
See Lithium fluoride–sodium fluoride systems.

Sodium fluoride–lithium fluoride–zirconium fluoride systems
See Lithium fluoride–sodium fluoride–zirconium fluoride systems.

Sodium fluoride–uranium(III) fluoride systems

phase studies, 11: 3372

Sodium fluoride–uranium(IV) fluoride–zirconium fluoride systems (liquid)

viscosity, 11: 13610, 13612

Sodium fluoride–zirconium fluoride systems

corrosive effects on graphite, 11: 13582(R)

thermal capacities, 11: 12976, 12978

vapor pressures from 599 to 1075°C, 11: 5230(J)

Sodium fluoride–zirconium fluoride systems (liquid)

corrosion of Ni in, 11: 7407(R)

corrosive effects, 11: 9581(R)

solvent properties for U alloys, 11: 10820(R)

solvent properties for U–Zr and Sn–U, 11: 9580(R)

Sodium fluorides

luminescence of, activated by uranium, 11: 12002(J)

paramagnetic resonance of impurities, 11: 8854(J)

sorptive properties for UF_6 at 300°C, 11: 13656(R)

vapor pressure and equilibrium, 11: 9240

vapor pressures from 930 to 1075°C, 11: 5232(J)

Sodium Graphite Reactor (SGR)
See Sodium Reactor Experiment.

Sodium halide–sodium systems
See Sodium–sodium halide systems.

Sodium halides

energy level calculations for F-centers and interstitial positive ions in, 11: 12777

Sodium hydrides

preparation in coordination solvents, 11: 4380

solubility in Na, 11: 5314(J)

Sodium hydroxide–nickel systems
See Nickel–sodium hydroxide systems.

Sodium hydroxides

concentration by electrodialysis, 11: 11648

dissolution of Al–U alloys in, 11: 2819(J)

reactions between Ni and, in vacuum at temperatures to 1000°C, 11: 2818(J)

specific heat capacity of, at high temperatures, 11: 102(J)

thermodynamic characteristics at high temperatures, 11: 101(J)

uranium precipitation using, 11: 10827

Sodium hydroxides (liquid)

corrosion and metal transport in, at temperatures up to 815°C, 11: 12030(J)

corrosive effects and mass transfer in, 11: 12456(R)

corrosive effects of, on Fe–Mo–Ni alloys, 11: 13324(J)

corrosive effects on construction materials at high temperatures, 11: 5312

corrosive effects on stainless steel at elevated temperatures in SIR, 11: 10877

manganate distribution, effects of O_2 pressure on, 11: 3332(J)

permeability to H_2, 11: 13825(R)

reactions with metals, 11: 358(J)

reactions with metals, thermodynamic properties, 11: 11574(R)

Sodium iodide crystals

background radiation detected by, 11: 4583(J), 6482(J)

conversion efficiency of Tl-activated, 11: 11323(R)

efficiency, effects of size and geometry, 11: 4016(R)

efficiency of gamma-ray detecting, 11: 488

geometry for calibration of Th activated, 11: 13582(R)

linear absorption coefficients for photoelectric and Compton effects, 11: 10996(R)

peak efficiency for γ rays from 0.150 to 7.5 Mev, 11: 4586(J), 6482(J)

peak-to-total ratios for 3 in., 11: 13430(R)

response to nuclear radiation, 11: 12070

Sodium ions

electron-loss cross sections, 11: 7347(J)

relative mobilities in aqueous solution, 11: 8988(J)

self-diffusion in fused $NaNO_3$ from 315 to 375°C, 11: 11576(R)

self-diffusion in polysterenesulfonated solutions, 11: 9587(R)

Sodium isotopes

neutron resonances, 11: 550(R)

Sodium isotopes Na^{22}

beta decay, circular polarization of γ rays, 11: 8154(J)

half life, 11: 3526(J)

longitudinal polarization measurement of positrons emitted, 11: 10259(J)

positrons from, backscattering, 11: 4151(J)

separation from irradiated Al by cation exchange, 11: 196(J)

Sodium isotopes Na^{23}

deuteron reactions (d,n), 11: 8147(J)

deuteron reactions (d,p), proton spectra, 11: 12863(J)

energy levels, 11: 1542(R)

energy levels from (p,p′) reaction, 11: 9457(J)

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

excited state at 4.43 kev, lifetime, 11: 6863(R)

inelastic scattering between resonances, contribution of Coulomb excitation, 11: 2080(J)

neutron reactions (n,γ), conversion spectra of, 11: 3089(J)

nitrogen ion reactions (N^{14}, N^{15}), cross sections, 11: 6933(J)

nitrogen nucleus reactions (N^{14}, αp) and (N^{14}, α2p), excitation functions, 11: 701(J)

nuclear magnetic energy levels of, ultrasonic excitation, 11: 3039(J)

nuclear magnetic resonance spectrum in $NaH_2PO_4.2H_2O$, 11: 1290(J)

Sodium isotopes Na^{23} (cont'd)
nuclear spin, 11: 9752(R)
proton elastic scattering, 11: 1296(J)
proton reactions (p,γ), angular distributions of γ rays, 11: 1346(J)
proton scattering between 0.5 and 2.6 Mev, 11: 1680(J)
resonances in the γ-ray yield, effect of proton bombardment, 11: 1344
spin and parity of the first excited state, 11: 2083(J)
transition in 440-kev region, 11: 3060(J)
Sodium isotopes Na^{24}
applications in measurements of blood circulation, 11: 9207(J), 11908(J)
beta spectra, evidence for small deviations from the allowed shape, 11: 10704(J)
formation in neutron-irradiated foodstuffs, 11: 5733
gamma rays, polarization-direction correlation of successive, 11: 4059(J)
half lives, 11: 8283(R)
ion exchange separation from reactor cooling water, 11: 2242(R)
separation of trace amounts from reactor effluent water, 11: 11121
Sodium–mercury alloys
See Mercury–sodium alloys.
Sodium metaborates
See Sodium borates.
Sodium niobates
dielectric properties and phase transitions, 11: 968
Sodium nitrate crystals
cell constants and expansion coefficients, 11: 1206(J)
Sodium nitrate–silver nitrate systems (liquid)
See Silver nitrate–sodium nitrate systems (liquid).
Sodium nitrates
as corrosion inhibitor in storage water basin, 11: 270
entrainment of impurities during crystallization, 11: 6239(J)
equilibrium between KNO_3, Na_2SO_4, K_2SO_4, and, 11: 6751(J)
radiolysis due to γ irradiation, 11: 8286(R)
refractory index, 11: 8279
Sodium nitrates (liquid)
diffusion of Na^+ in, 11: 8286(R)
effects on Ni, Co, Al, and steel, 11: 1918(J)
self-diffusion of Na^+ and NO_3^- in, 11: 11576(R)
Sodium oxalates
radiation effects, 11: 12970(R)
Sodium oxide–tantalum oxide systems
partition of oxygen in, 11: 11050
Sodium oxides
determination in Na, 11: 13564(R)
solubility in liquid sodium, 11: 3328, 8686(R)
Sodium–oxygen systems
See Oxygen–sodium systems.
Sodium peruranates
See Sodium uranates.
Sodium phosphates
hydrolysis, kinetics and mechanism, 11: 2821(J)
pH control and the prevention of caustic cracking, 11: 2109
radiation effects on, neutron and gamma, 11: 12690(J)
Sodium polyphosphates
See Sodium phosphates.
Sodium–potassium alloys
See Potassium–sodium alloys.
Sodium–potassium alloys (liquid)
See Potassium–sodium alloys (liquid).
Sodium Reactor Experiment
control analysis of PuP #30C, 11: 8699
control and instrumentation, 11: 10290
control and safety of steam demand temperature transients, 11: 6070
control element design, 11: 7846(R)
control rod design, 11: 8688(R)
control system design changes, 11: 6086
conversion ratio vs. burnup, 11: 8686(R)
coolant flow in fuel elements of, 11: 4107(J)
cooling system, 11: 8688(R)
cooling system, fuel element and control rod testing, 11: 9478(R)
cooling system design, 11: 7846(R)
core and moderator design, 11: 7846(R)
core configurations, reactivity, and construction, 11: 4095(R)
core structure, 11: 9478(R)
core tank design, 11: 8686(R)
cost analysis of dual reactor and two-diameter fuel rod design, 11: 8686(R)
criticality studies, 11: 8686(R), 10289
criticality theory, 11: 13860
design, construction, and component development, forum on, 11: 5028
design, fuel elements, matrices, flux distributions, moderators, pressure distributions, shielding, and operations, 11: 13969(R)
design, reactivity, control, safety, fuel elements, neutron economy, and shielding, 11: 7847(R)
design and development, 11: 10736(R), 12575(R), 13503(R), 13968(R)
design and development of components, 11: 13516(J)
effects of cooling system design on power, 11: 8686(R)
exponential experiments for, procedures and safety considerations, 11: 6898
fuel element design, 11: 7846(R)
fuel elements, buckling and neutron flux distribution in fuel clusters, moderator and reflector design and fabrication, shielding, coolant radioactivity, and gas systems, 11: 7848(R)
fuel feedback of Pu, 11: 7846(R)
gamma-induced heating of thermal shield, 11: 9894
heat transfer, neutron flux distribution, and parameter survey of, 11: 9850
loading equipment for, 11: 8686(R)
moderator cans, development of Zr, 11: 9133(J)
neutron leakage, 11: 8686(R)
neutron leakage from 30 megawatt, 11: 8175
poisoning from Xe and Sm, 11: 8686(R)
power surges in startup, 11: 8686(R)
reactivity and safety, 11: 8688(R)
safety, 11: 6086
safety, interaction of the nuclear and power plant controls, 11: 12872

Sodium Reactor Experiment (cont'd)
shielding, group theory calculation for, 11: 11425
shielding analysis, 11: 8688(R)
shielding design, biological, 11: 10287
shielding design for, 11: 7846(R)
startup and reactivity, 11: 8687(R)
temperature coefficient of reactivity, 11: 8686(R)
upflow design, characteristics, safety, and economics, 11: 12595
Sodium silicate glass
wetting properties for Pt, pressure dependence, 11: 1543(R)
Sodium silicates
wetting properties for platinum, 11: 13332
Sodium–sodium chloride systems
vapor pressure, 11: 9587(R)
Sodium–sodium halide systems
phase studies, 11: 9587(R)
Sodium sulfates
equilibrium between $NaNO_3$, KNO_3, K_2SO_4, and, 11: 6751(J)
solvent properties of aqueous, for $Nd_2(SO_4)_3$ at high temperatures, 11: 5757
specific heat capacity of, at high temperatures, 11: 102(J)
thermodynamic characteristics at high temperatures, 11: 101(J)
thermoluminescence, 11: 7220(J)
Sodium sulfites
corrosion inhibition effects on boilers in feed water, 11: 13753
use as O scavenger in HRT, 11: 2109
Sodium systems
weight gains of Zr in, 11: 13969(R)
Sodium tartrates
(See also Potassium sodium tartrates.)
radiation effects, 11: 12970(R)
Sodium tetramethoxyborates
thermodynamic properties, 11: 8819
Sodium thorium fluorides
preparation and electrolysis for production of Th, 11: 13096(R)
Sodium tungstates
composition diagram of melting, 11: 1770(J)
Sodium–tungsten bronze
phase studies and hardness, 11: 7673(R)
physical properties, 11: 8512(R)
Sodium uranates
dissolution to facilitate removal from metal waste tank, 11: 7591
precipitation from waste solutions by NaOH reaction, 11: 7440(R)
production from N. G. solutions, 11: 11644
Sodium uranyl carbonates
solubility in Na_2CO_3, 11: 2405
Soils
(See also Silts.)
contaminated by fission products, effect of exchange reactions and cropping on plant uptake, 11: 897
contaminated with Pu, redistribution of Pu in, 11: 10803(R), 13247
Soils (cont'd)
corrosive effects on stainless steel, cast iron, and galvanized steel pipes, 11: 2479
densities of, γ backscattering applied to determination, 11: 3187(J)
fission product adsorption on river sediment, 11: 8790(R)
fission product permeability, 11: 52(R)
fixation and exchange of fission products by, 11: 8258(R)
infiltration of water into, effects of chemicals on, 11: 11130
ion exchange properties, 11: 52(R)
properties, tracer studies, 11: 17(J)
radiological monitoring procedures, 11: 6817
radiometric analysis, sample collection and processing, 11: 7695(R)
radiometric analysis for fall-out contamination, 11: 13565(R)
radiometric analysis for fission product activity, 11: 8793(R)
radiometric analysis for Sr^{90}, 11: 3690, 6612, 6613
radiometric analysis of contaminated, and plants from Bravo Shot, 11: 11082
spectrographic determination of Sr and Ca in, 11: 7398(R)
temperatures, annual variations, 11: 4501(J)
Solar batteries
design studies using photoelements, 11: 801(J)
evaluation as unconventional source of electricity, 11: 9345
Solar furnaces
economic and design study, 11: 385
heat flux measurements at sun image of CIT lens-type, 11: 2964
performance characteristics of parabolic, 11: 5371
proceedings of the 1957 symposium, 11: 8031(J)
utilization in solids research, 11: 3876
Solar power
applications for the generation of high temperature, 11: 1044(J)
Solders
corrosion by BrF_3, 11: 13579(R)
corrosion of, in bonding Al to U, 11: 12471
phase studies and effects of low temperatures, 11: 6733
properties for joining Al to stainless steel, 11: 12743
soft, effect of low temperatures, 11: 2523
tensile properties, effects of alloying elements on, 11: 6733
Solid Moderator Reactor (SMR)
See Critical assemblies.
Solid propellants
radiation effects, 11: 11469
Solid solutions
(See also Constitution diagrams.)
diffuse scattering of x radiation by, theory, 11: 12926(J)
Solids
displacement of atoms in, by radiation, 11: 7366(J)
ferromagnetic domain theory, 11: 6427(J)
heat conduction equation in internally bounded cylindrical, solutions of, 11: 1853(J)
heat transfer, 11: 11669
physical properties, radiation effects on, 11: 1333(J), 2186(J)
pore volume, methods for computing, 11: 11990(J)

Solids (cont'd)
positronium formation in, 11: 575(J), 6495(J)
properties of group III-group V compounds, 11: 6427
radiation damage in crystalline, review, 11: 5067(J)
radiation damage in ionic, 11: 763(J)
radiation damage studies in, nuclear resonance absorption technique, 11: 3596(R)
radiation effects, 11: 9890
radiation effects on, bibliographies, 11: 1370, 5667
radiation effects on electronic properties, 11: 7362(J)
solubility in gases, 11: 8029(J)
specific heat at high temperatures of, design of calorimeter for determination, 11: 1176
thermal conductivity, bibliography on methods of measuring, 11: 1031
thermal conductivity measurements, apparatus for, 11: 13578(R)
thermal neutron mean transfer free paths, 11: 682(J)
thermal neutron scattering in polycrystalline, 11: 591(J)
Solubility
measurement, 11: 8707(R)
Solutions
activity and properties of particles constituting, 11: 4269(J)
automatic analyzer for U determination in aqueous, 11: 2840(J)
chemical control, corrosive effects on building materials, 11: 11686
conductivity of process, 11: 13564(R)
radioinduced changes in aqueous, review, 11: 9945(J)
theoretical models for primary metallic, 11: 3426
Solvent extraction processes
(See also Solvent partition.)
calculation procedures for evaluating, 11: 9641
comparison of U^{233} recovery by various, 11: 8392
corrosion of stainless steels in simulated solutions, 11: 8459
development and semiworks tests of Chelate Process, 11: 9667
development for ORNL waste recovery, 11: 12368
efficiency of horizontal countercurrent extractors, 11: 12407
equipment and reagent testing for U ore processing, 11: 980(R)
feasibility of ultrasonic, 11: 1822(R)
feed preparation, pre-treatment for Ru, Zr, and Nb removal, 11: 11974
fission product decontamination, 11: 12330(R)
flowsheets for EBR fuel element, 11: 7825
flowsheets for ore processing, 11: 2858
industrial aspects, review, 11: 5273(J)
liquid metal, for spent fuel, 11: 13517(J)
mass transfer in, effects of physical properties of solvents on, 11: 8705(R)
mathematical analysis, 11: 5253
multi-purpose centrally located extraction plant, chemical principles, 11: 1006(J)
pentaether, recovery and decontamination of U by, 11: 2304
radiation effects on TBP–naphtha systems, 11: 3744(J)
raffinate processing for fission product recovery, 11: 12373
for separation of Nb and Ta, 11: 3229(P)
Solvent extraction processes (cont'd)
separation of Pu and U by anion exchange, 11: 9662
separation of Th and U from monazites by, 11: 13634
for separation of uranyl nitrate, 11: 2868(J)
sonic effects, 11: 185(R)
survey, 11: 7535
for thorium purification, design and cost evaluation of, 11: 11626
Solvent partition
(See also Solvent extraction processes.)
in analytical chemistry, 11: 12679(J)
determination and meaning of, 11: 11246
of elements with trialkyl- phosphine oxides, 11: 2855
general equations for inorganic compounds, 11: 3764(J)
mass transfer rate, 11: 10584
theory, correlation of interfacial area with physical properties, 11: 9580(R)
ultrasonic effects on liquid-liquid extraction, 11: 9256
of uranium, Bi, Pb, and Cu with EDTA, effect of acetylacetone, 11: 3763(J)
variation of distribution quotient with cation concentration, 11: 3765(J)
Solvents
(See also specific substances used as solvents.)
activity coefficients and thermodynamic properties, 11: 4269(J)
evaluation for U extraction, 11: 7555
flammability of Purex Process, 11: 3360
miscibility of kerosene with organic, 11: 3361(R)
nonpolar, solubility of H_2 and D_2, 11: 6680(J)
organo-phosphorus, use in extracting U, Th, Pu, and fission products, 11: 9663
physical properties, effects on mass transfer in extraction processes, 11: 8705(R)
properties for extraction of Pu, 11: 10838(R)
properties of organic, at very low temperatures, 11: 8282(R)
recovery of TBP by vacuum distillation, 11: 7130(R)
recovery of U^{233}, use of methyl isobutyl ketone, diisopropyl ether, and dibutyl cellosolve, 11: 8392
removal of perclene from PWR blind access holes, 11: 12565
solvent properties for inorganic salts, 11: 9222(J)
testing for use in solvent extraction of U, 11: 3690, 9626(R)
Solvolysis
tables of chemical kinetics, 11: 4819(J)
Sonic inspection
(See also Ultrasonics.)
design of ultrasonic scanning and recording system, 11: 11173(J)
development of simple circuit for, 11: 9372
equipment for use on Hanford fuel elements, 11: 11783
flow detector for U utilizing, 11: 7697
testing equipment, 11: 8903(J)
transformation and nonbond tester for, of flat fuel elements, 11: 7698
Sorption
(See also Absorption; Adsorption.)
effects of chemical nature and porosity of surface on, by silica gel, 11: 1009(J)

Sound

acceleration by, 11: 11244

acoustic boundary layer near rigid walls, 11: 1502(J)

compression waves in Al, transit times of, 11: 2492

degassing of Al and Al–Mg by, 11: 3857(J)

pitch periodicity analysis, 11: 8025(R)

velocity measurements in liquid metals, 11: 1181

velocity measurement in liquids containing gas bubbles, 11: 10106

Sounding balloons
See Balloons.

Sounding rockets
See Rockets.

South Carolina (Anderson Co.)

exploration of Big Generostee Creek Area in, 11: 5315

South Carolina (Cherokee Co.)

exploration of Broad River and Thicketty Creek Areas, 11: 4864

South Carolina (Laurens Co.)

exploration of North and South Rabon Creek Areas in, 11: 5315

South Carolina (Spartanburg Co.)

geophysical exploration for monazite in, 11: 3820

South Dakota

uranium deposits, collected field material on, 11: 6356(R)

uranium deposits, mineral determinations in, 11: 5317

South Dakota (Billings Co.)

uranium occurrence in Cave Hills and Slim Buttes areas in, 11: 1082

South Dakota (Fall River Co.)

geologic map of Edgemont NE Quadrangle in, 11: 3410(J)

preliminary geologic map of east-central part of Minnekahta Quadrangle, 11: 9293(J)

preliminary geologic map of southeast part of Minnekahta Quadrangle, 11: 9294(J), 9295(J)

preliminary geologic map of west-central part of Minnekahta Quadrangle, 11: 9292(J)

South Dakota (Harding Co.)

occurrence of uraniferous lignite deposits in Cave Hills in, 11: 4434

uranium occurrence in lignites in, 11: 1082

South Muddy Creek Area (N. C.)

geophysical exploration, geology, and mineralogy, and monazite reserves, 11: 3404

South Rabon Creek Area (S. C.)

exploration, geology, mineralogy, and monazite placer deposits in, 11: 5315

Southern Research Inst., Birmingham, Ala.

progress reports on aircraft structural metals, 11: 2925(R), 3851(R)

Soviet Union

applications of stable and radioactive isotopes in the national economy and science, conference, 11: 11016(J)

nuclear power development program, 11: 2121

power reactor program, 11: 11832(J)

research programs on nuclear physics, 11: 3272

uranium prospecting in satellite countries, 11: 12038(J)

Spallation

of medium weight elements, 11: 6545

Spallation (cont'd)

observation and measurement of a star from a high-energy, 11: 2170(J)

survey, 11: 3096(J)

yields from high-energy proton bombardment of heavy nuclei, theory, 11: 3581(J)

Spark detectors

construction and characteristics of plane parallel, 11: 5416(J)

design of BF_3 filled counter for slow neutrons, 11: 9005(J)

operating characteristics of single-and multiple-wire, 11: 9006(J)

spectrographic analysis of alpha-active materials with, 11: 2841(J)

time-resolving power of plane-parallel, 11: 5417(J)

triggered, for particle trajectory determination, 11: 9013(J)

Spark shadowgraph photography

equipment, 11: 4412(R)

Sparking
See Dielectric breakdown; Electric arcs; Electric discharge; Electric insulators.

Special hazards
See Criticality studies; Radiation monitoring.

Specific gravity
See Density.

Specific heat

design of apparatus for measuring, 11: 5891

of liquid metals and fused salts, 11: 3878(J)

of solids at high temperatures, design of calorimeter for determination, 11: 1176

theory, 11: 6426(J)

Spectra

(See also specific spectra, e.g., Cosmic ray spectra.)

atomic, analysis with electronic digital computers, 11: 2199(J)

atomic, effective cross sections in impact processes, 11: 9523(J)

derivative, method of obtaining, 11: 6974(J)

excitation in arc column, stabilization, 11: 7370(J)

hyperfine structure of paramagnetic resonance of Cu tetraphenyl porphine, 11: 2075(J)

intensity ratio calculation of lines, background consideration, 11: 6163(J)

of macroscopic systems of interacting particles, 11: 8233(J)

theory, effect of higher atomic states on line broadening, 11: 793

Spectrometers

(See also specific types of spectrometers, e.g., Beta spectrometers; Gamma spectrometers.)

aberrations and fringing effects in 180° double focusing magnetic, 11: 3975(J)

adaptation as an absolute Pulfrich refractometer, 11: 12796(J)

bridge balance for nuclear spin resonance, automatic, 11: 10368(J)

design and operation of nuclear magnetic resonance, 11: 13299

design and performance of, with improved focusing, 11: 3486(J)

design for isotopic assay of Li, 11: 2283

design of, for detection of atomic or molecular rays, 11: 5680(J)

design of, for magnetic field measurement and stabilization, 11: 454

design of, for radioactivity measurements, 11: 12933

design of 21-ft, using a plane grating, 11: 11992

design of coaxial static-electromagnetic velocity, for high energy particles, 11: 10787

Spectrometers (cont'd)
design of double focalization electron, 11: 10608(J)
design of electron spin resonance, for detecting radiation damage in solids, 11: 3470
design of emulsion, for charged particle momentum determinations, 11: 4945(J), 4946(J)
design of high-resolution low-field nuclear magnetic resonance, 11: 6443
design of magnetic, for detection of charged particles, 11: 3969(J)
design of 3 crystal pair, 11: 1273(R)
design of total absorption type, using PbF_2 crystals, 11: 9004(J)
development at Chalk River, 11: 9054(R)
field stabilizer for high-resolution nuclear magnetic resonance, 11: 10369(J)
high resolution neutron velocity, with betatron source, 11: 10370(J)
hollow cathode discharge tube and high voltage power supply for, 11: 11625
light arc for high power outputs, 11: 12301(J)
nuclear magnetic resonance, design, 11: 12122(J)
polarization method of measuring velocities of particles with intrinsic magnetic moment, 11: 12944(J)
polarizing, design of ellipsometer for measuring adhesive thickness, 11: 5302
proportional counter, 11: 8117(R)
response of total absorption, to γ rays, 11: 6482(J)
scintillation, Compton effect reduced in, 11: 1705(J)
scintillation, for pulse-height studies on electromagnetic radiation and α particles, 11: 9373(J)
scintillation, monoenergetic absorption peaks obtained with, 11: 9020(J)
scintillation, performance for direct analysis of x-ray beam, 11: 4941(J)
Spectrophotometers
derivative spectra recorded by, 11: 6974(J)
designs of new, 11: 7369(J)
Spectrophotometry
(See also Colorimetry.)
of complex metal ions in fused slats, 11: 5278(J)
cryostat for measurements in, 11: 3927(J)
mathematical analysis, 11: 2828
sample transport and temperature measurements in porous-cup discharges, 11: 6265(J)
Spectroscopy
(See also Beta spectroscopy; Gamma spectroscopy; Infrared spectroscopy; Microwave spectroscopy; Neutron spectroscopy; Ultraviolet spectroscopy; X-ray spectroscopy.)
analysis of Th and U spectra, 11: 205(J)
of beryllium by cathode layer technique, 11: 5221(J)
of charged particle beams in electrostatic field, 11: 10367(J)
coherence time measurement by magnetic resonance vs. magnetic depolarization, 11: 9175(J)
combination scattering spectra in gases, measurements, 11: 4186(J)
contributions to nuclear physics, 11: 8235(J)
design of semi-automatic arc gap for emission, 11: 3915(J)
dispersion and absorption of solid bodies, 11: 4187(J)
emissivity of spectral lines of metal vapors in a flame, 11: 795(J)
high resolution, multiplex etalons in, 11: 10486(J)
Spectroscopy (cont'd)
intensity of Stokes' lines from first order combined dispersion, temperature dependence of, 11: 794(J)
of metals, instrumentation, 11: 463(J)
method of admixtures in, 11: 13300(J)
molecular and atomic, review of Soviet All-Union Conference on, 11: 3621(J), 10366(J)
molecular electronic, review, 11: 4755(J)
nuclear, calculations with the harmonic oscillator shell model, 11: 4185(J)
nuclear, Conference in Leningrad, U.S.S.R. Jan. 25–31, 1957, 11: 12304(J)
sample preparation, scoop method, 11: 13599(R)
sample preparation using graphite base, 11: 4310(J)
of tissues, sample preparation, 11: 7925
use of commercial sheet film, 11: 6307(J)
vibration-rotation, review, 11: 4756(J)
Sperm
radiation effects of massive doses of gamma rays on rat, 11: 11866(J)
radiation effects on, in mouse, 11: 1744(J), 9934(J)
radiosensitivity of Habrobracon, effects of anoxia, 11: 5719(J)
ultraviolet irradiation effects on, activity in induction of gynogenesis in mice, 11: 9935(J)
Spermatogenesis
(See also Gonads.)
in domestic animals, tracer study, 11: 17(J)
radiosensitivity in Drosophila, tracer study, 11: 4240(J)
radiosensitivity in grasshoppers, 11: 7910(R)
radiosensitivity in mature bulls, 11: 11021(R)
radiosensitivity in rats, 11: 12645, 12646
sensitivity to fast neutrons during different stages, in Drosophila, 11: 1743(J)
SPERT
See Reactor safety experiments.
Sphalerites
flotation, and activation, effect of depressing agents on, 11: 3784
Spheres
(See also Reactor fuel spheres.)
criticality studies for safe handling, storing and shipping, 11: 1275(R)
fluid flow in, 11: 7857(R)
homogeneous, containing uniform source distribution, flux from, 11: 2760
hydrodynamics of reactor vessel, 11: 2641
neutron absorption in, 11: 13577(R)
non-linear deflections of shallow spherical shells under uniform external pressure, 11: 5429
packing reproducibility and flow, 11: 10054
reactor cores of, critical sizes and multiplication rates, 11: 1637
self shielding by poisons in inhomogeneous mixtures, 11: 1382(J)
thermal expansion stresses in clad shells, 11: 8559
thermal stresses in shells, mathematical analysis, 11: 8560
time and space temperature distribution with a constant heat source, 11: 12011

Spheres (cont'd)
of uranium alloys, preparation, 11: 13785
Spheroidal nuclear models
See Nuclear models (spheroidal).
Spiderwort
See Tradescantia.
Spin
See Nuclear spin.
Spinal cord
lesions, detection by radioisotope myelography, 11: 7083(J)
Spinels
corrosion, 11: 8707(R)
corrosion by sodium borate melts, 11: 7188(J)
formation by reaction in solid state, tracer study, 11: 87(J)
insulation properties at elevated temperatures, 11: 1860(J)
Spinner columns
performance, 11: 8333
Spleen
effects of released desoxyribonuclease on DNA in spleen of irradiated rats, 11: 9194(J)
effects of shielding during irradiation on blood serum Fe levels, 11: 1725(R)
homogenates, effects of irradiation on enzyme activity, 11: 7915(J), 7916(J)
homogenates, therapeutic effects against radiation injuries in mice, 11: 6617(J)
radiation effects on deoxyribonucleoprotein complex of mouse, 11: 8766
radioinduced changes in lymphoid tissue of, in mice exposed to γ radiation, 11: 9928(J)
radioinduced changes in nucleic acids, 11: 2780, 2791(J)
radiosensitivity, in rats, 11: 3292(J)
radiosensitivity in mice, 11: 5743(J)
radiosensitivity measured by release of soluble nucleotides, 11: 11087
radiosensitivity when implanted in mice, negative results, 11: 9961(J)
tissue preparations, protective effects against irradiation injuries in mice, 11: 5740(J)
uranium content in beef, 11: 1434(J)
Spot tests
See Colorimetry.
Spray columns
(See also Extraction apparatus.)
analysis of holdup and flooding rates, 11: 2867(J)
Sprays
for decontamination, performance, 11: 14020(R)
reactor cooling with, effectiveness, 11: 8576
Springs
(See also materials used for springs; for springs of water, see Ground waters.)
corrosion of stressed and unstressed Inconel-x, Haynes 25, and Allegheny A286 by water, 11: 10080
radiation effects, 12: 13724
SRE
See Sodium Reactor Experiment.
Stable isotopes
preparation and purification, 11: 3935(R)
price list and inventory of electromagnetically enriched and other, from ORNL, 11: 10906
solid mass spectrometer analyses of enriched, 11: 10622
uses in heterogeneous-catalytic-reaction studies, 11: 210(J)
Stack disposal
(See also Meteorology; Radiation; Smoke generators; Smokes.)
air cleaning techniques, 11: 7595
air pollution, 11: 8257(R)
dilution factor estimation at KAPL separations process, 11: 9577(R)
effectiveness, 11: 12638
effectiveness for active pile gases, 11: 3376(J)
effectiveness in removing radioactive particles, 11: 6001
efficiency of air cleaning equipment on, 11: 8837
fog dispersion experiments at Brookhaven, 11: 7731(R)
iodine removal, regeneration of Ag reactors, 11: 1323
of incinerated solid wastes, seminar on, 11: 2473
monitoring in vicinity of 185-ft stack, 11: 4424
parameters in diffusion calculations, 11: 2471
particulate deposition, methods for prediction, 11: 5734(J)
rise of smoke plume, effect of speed of emission, 11: 4423
systems for HRT, 11: 10867
Stainless steel
activation induced during one cycle of MTR highest flux, 11: 2758
adsorptive properties for U, 11: 14041
age hardening and nitriding, effect of Ti on, 11: 2536
bend tests on, 11: 7861(R)
brazing, 11: 13564(R)
brazing to nickel alloys, 11: 7196(R)
brazing type 304 to type 304 with high temperature brazing alloys, 11: 13798
burnout studies at 1,000 psia and 2,000 psia, 11: 13866(R)
carburization, 11: 9725
carburization of type 347 by carbon contaminated Na, 11: 12467
cathodic protection, feasibility, 11: 2478
cleaning, removal of Na and Na sludges with NH_3 and NH_4Cl, 11: 12669
cleaning pipes and tubing of, for nuclear coolant systems, 11: 13337
compressive strain-stress properties at elevated temperature, 11: 11205
corrosion, 11: 8296(R), 8631, 8707(R), 9863(R), 11682(R), 12585(R), 12970(R), 13197(R), 13985(R)
corrosion, effects of radiation on, 11: 6720
corrosion, inhibition by CO, 11: 8286(R)
corrosion, inhibition by SiO_2, GeO_2, and ZnO, 11: 13866(R)
corrosion, mechanical and high-temperature properties, welding, and structure, survey and bibliography of current literature, 11: 350(J)
corrosion and decontamination, 11: 12584(R)
corrosion and wear, data for water-cooled reactors, 11: 12028
corrosion by ammonium uranyl phosphates, 11: 9724
corrosion by acid nitrate solutions, effect of Hg on, 11: 7608
corrosion by anisol–BF_3 system, 11: 6368(R)
corrosion by $Al(NO_3)_3$–$Na_2Cr_2O_7$–$UO_2(NO_3)_2$ solutions, 11: 8459

Stainless steel (cont'd)
corrosion by barium chloride, 11: 4163
corrosion by biphenyl, 11: 5310
corrosion by Bi–U liquid alloy, 11: 7710(R)
corrosion by bismuth–zirconium alloys (liquid), 11: 8445
corrosion by boiler water, 11: 12898(R)
corrosion by boiling $UO_2(NO_3)_2$–H_2SO_4 media, effect of Al-inhibited fluoride on, 11: 7620
corrosion by $CuSO_4$–H_2SO_4–UO_2SO_4 systems, 11: 9287, 10529
corrosion by decontaminating solutions, 11: 8708(R)
corrosion by fluorine gas at high temperatures, 11: 7184
corrosion by fuel solutions, 11: 6536(R), 7861(R), 9587(R)
corrosion by fuel solution in in-pile loop, 11: 12898(R)
corrosion by fused fluoride melts, 11: 9581(R)
corrosion by high-temperature H_2O, 11: 2903(J), 2904(J), 10537, 10988(R)
corrosion by HF–HNO_3, 11: 7610, 8271, 13340
corrosion by HF–HNO_3 and HNO_3–$Na_2Cr_2O_7$, 11: 3813
corrosion by liquid ammonia cleaning solution, 11: 12733
corrosion by liquid sodium, 11: 3398, 7727, 9285, 12555(R)
corrosion by liquid sodium and microstructure, 11: 5311
corrosion by Li_2SO_4–UO_2SO_4 solutions, 11: 11678, 11679
corrosion by monazite digestion mixtures, 11: 11597
corrosion by nitric acid, 11: 3812, 4430(R), 8357(R), 11574(R), 12473(R)
corrosion by HNO_3, WAPD-30 in-pile loop, 11: 10079
corrosion by nitric acid and machine wash solutions, 11: 13027(R)
corrosion by HNO_3–HF and HNO_3–H_2SO_4 Th dissolver solution, 11: 7515(R)
corrosion by nitric acid–mercuric nitrate systems, 11: 7572
corrosion by HNO_3 of weld-affected zone in, 11: 8934(J)
corrosion by nitric acid–plutonium solutions, 11: 3814
corrosion by reactor control poisons, 11: 9716
corrosion by reactor slurries, 11: 7716, 9722
corrosion by reactor solutions and slurries, 11: 6092
corrosion by Redox Process solutions, 11: 8454, 12339(R)
corrosion by sodium and NaK, 11: 2481(R)
corrosion by sodium at 900°F, 11: 227
corrosion by sodium at 1000 to 1700°F, effects of aniline, air, Mg, S, and V on, 11: 5860
corrosion by sodium saturated with Na_2O, 11: 3328
corrosion by sulfuric acid, 11: 1866, 3809(R)
corrosion by H_2SO_4 at 150°C, 11: 10875
corrosion by supercritical water, 11: 7992(J)
corrosion by Thorex Process streams, 11: 7487, 13019(R)
corrosion by thorium oxide slurries, 11: 1074, 1862, 8448
corrosion by thorium slurries, 11: 8625
corrosion by TBP Process streams, 11: 8455
corrosion by 25 Process first cycle raffinate, 11: 7478
corrosion by UCl_3–H_2O, HCl, UCl_3–HNO_3, and H_2SO_4, 11: 12965(R)
corrosion by U derby pickle baths, 11: 7603
corrosion by uranyl fluoride, 11: 13057
corrosion by uranyl sulfate, 11: 6348(R), 7857(R), 7858(R), 7859(R), 8708(R), 8739, 8911, 9719, 10531, 11677, 13743
corrosion by UO_2SO_4, effect of Li_2SO_4, 11: 12463
Stainless steel (cont'd)
corrosion by UO_2SO_4, effects of radiation, 11: 9587(R)
corrosion by UO_2SO_4, ThO_2 slurries, and mineral acids and in-pile corrosion, 11: 9869(R)
corrosion by UO_2SO_4 as effected by history and additions of Cl^-, Br^-, pertechnetate ions and $BeSO_4$, 11: 12898(R)
corrosion by UO_2SO_4 at 250°C, 11: 7607, 11675
corrosion by UO_2SO_4–$LiSO_4$, 11: 13745
corrosion by UO_2SO_4 solutions and corrosion inhibition by Graphitar, 11: 7606
corrosion by uranyl sulfate–D_2O system, 11: 1863
corrosion by water, 11: 10818, 11183, 12329(R), 13837(R)
corrosion by water, effects of deuteron irradiation on, 11: 8737
corrosion by H_2O, H_2SO_4, and UO_2SO_4, effects of pertechnetate on, 11: 11676
corrosion by water at 580°F, effects of radiation on, 11: 2482
corrosion in core of homogeneous thermal breeder, 11: 11760
corrosion in Homogeneous Reactor Test, 11: 2109, 4692(R)
corrosion in homogeneous reactors, 11: 10292, 13982(R)
corrosion in liquid Bi-base metals, 11: 8444
corrosion in TBP Process, 11: 8369
corrosion inhibition by O_2 in HRT fuel solution, 11: 13910
corrosion inhibitors for 347, in H_2O, 11: 13868(R)
corrosion of homogeneous reactor chemical plant hydrociones made of, 11: 13644(R)
corrosion of HRT leak detector tubing and flanges, 11: 4876
corrosion of mild and stainless, in Redox stream IAW, 11: 7523
corrosion of "O" ring gaskets in HRT, 11: 4088
corrosion of sensitized and unsensitized types 302 and 304 L by boiling 70% HNO_3, 11: 12321(R)
corrosion of 347, by liquid Na at 1000°F, 11: 8679(R)
corrosion of 347 weldments by Thorex Process solutions, 11: 13744
corrosion of 304-L and 347, by oxalic acid, 11: 3811
corrosion of 304L tubes, effect of carburization, 11: 12026
corrosion of type 410, in 680°F pure water, 11: 13750
corrosion of type 347 by boiling HNO_3, effect of Cl^-, 11: 12317(R)
corrosion of type 347 circulating water system at 475°F, 11: 13761
corrosion of types 347 and 309 SCb, by simulated 25 Process waste solutions at various temperatures, 11: 7612
corrosion product removal by $CrSO_4$–H_2SO_4, 11: 11680, 11681
corrosion products on, bibliography, 11: 3817(J)
corrosion studies, 11: 13782(R)
corrosion tests, 11: 13749
creep, effect of ceramic coating on, 11: 5307
creep and rupture under high temperature and stress, 11: 11220(R)
cryogenic data, 11: 386
cutting, 11: 3379
cyclic strain fatigue, 11: 10555
damping capacity, elastic properties, and fatigue at room temperature to 900°F, 11: 5345(R)
decontamination and corrosion, 11: 7775(R)
decontamination by electrolysis, 11: 10072

Stainless steel (cont'd)
decontamination by electropolishing, 11: 2500
decontamination of, effectiveness of reagents for, 11: 9727
descaling by electrolysis, 11: 1866
diffusion bonding to Zircaloy, 11: 9475, 11199
dissolution, sonic effects, 11: 5889(R), 7197, 8943(R), 10111(R)
dissolution by aqua regia, 11: 11054, 13661(R)
effects of protons on carburization at 600°F, 11: 8686(R)
electrochemical properties, effects of Cu^{2+} on, 11: 11576(R)
electrode potentials, effect of foreign ions on, 11: 9587(R)
electroplating with Cu, 11: 11203
erosion by ThO_2 slurries, 11: 12027(R)
erosion by ThO_2 slurries, effects of H_2 and $Na_4P_2O_7$ on, 11: 9720
evaluation of weld transition joints of type 304, to Croloy, 11: 1879
fabrication of leak free, 11: 1912(J)
fatigue resistance of AISI 347, 11: 3383
film studies on pretreated, and corrosion resistance, 11: 11801(R)
fission product permeability, 11: 1316
fluorimetric analysis for UO_2, 11: 6257
galling in Na, effect of nitriding and carburization on, 11: 2452
gamma absorption, 11: 10521(R)
heat radiation and emissivity measurements, 11: 3797
high-temperature corrosion by $NaF-UF_4$ and $LiF-UF_4$ systems, 11: 13762
high-temperature creep-rupture properties, 11: 323
high-temperature reactions with H_2O, 11: 4448(R)
intergranular oxidation, effects of temperature and stress on, 11: 2901
joints for plates of, corrosion testing, 11: 10987(R)
leak plugging of stress corrosion cracks in, 11: 13089
mass transfer in liquid sodium, 11: 3818(J)
mass transfer in liquid NaK loops, 11: 6719
mechanical properties, radiation effects on, 11: 10353(R)
mechanical properties, test procedures, 11: 12737
mechanical properties at very low temperatures, 11: 8006
mechanical properties of aircraft structural, data, 11: 1051
mechanical properties of weld heat-affected zone in type 347, time-temperature effect on, 11: 8934(J)
metallographic analysis and tensile properties of tubing of, for fuel jacketing, and friction of SGR core bottom of, 11: 7848(R)
neutron activation, effects of B^{10} additions on, 11: 5878
neutron reactions (n,γ), 11: 13209
passivation and activation in aerated H_2SO_4, 11: 9338(J)
passivation and corrosion studies, 11: 8706(R)
pipes, soil corrosion inhibition by cathodic protection, 11: 2479
plating out of Ra daughters from ThO_2 slurries, 11: 6405(J)
polarographic analysis for Cd and Pb surface contamination on, 11: 9230
pressure test of thermocouple insert seal weld of Co–Fe–Ni alloys to, 11: 1880
procurement specifications for government and for radioactive service, 11: 13796
properties, evaluation as high-temperature high-pressure process tube and slug jacket material, 11: 11193

Stainless steel (cont'd)
properties, corrosion resistance, and fabrication for use in pressure vessel construction, 11: 5904(J)
radiation effects, 11: 1276(R), 11688(R), 13724
radiation effects and creep, 11: 8747(R)
radiation effects of deuterons on type 309, 11: 13203(R)
radiation effects on hardness, 11: 13868(R)
radiation effects on tensile properties, 11: 9869(R)
radioactive decontamination, 11: 10987(R)
radioactive mass transport, 11: 8686(R)
radioactivity induced in, 11: 7857(R), 10554, 11226, 12329
radiographic inspection, 11: 10521(R)
reactivity effects of slug can of, 11: 5493(R)
remote welding of containers, equipment for, 11: 6386
rupture discs, effects of gaseous detonation on, 11: 1541
rupture of continuous calciner pots, 11: 8003
scrap, contaminated with uranium, hazards and control during handling, 11: 12658(J)
sheet weldability test for, 11: 376(J)
sliding friction and wear characteristics of, in high-temperature water, 11: 7328(R)
soldering of Al and Cu to, 11: 12743
solid state reactions between, and various reactor poison-bearing compounds, 11: 13881
specific heat, 11: 6382(R)
specifications for ORNL type 347, 11: 8480
strength of Carilloy T-1, 11: 10923(R)
stress-corrosion cracking in UO_2SO_4 solutions, 11: 6348(R)
stress corrosion cracking tests of retort and resistance annealed tubing of, 11: 13322
stress corrosion in caustic solution, 11: 10877
stress corrosion in reactor coolant, 11: 12608(R)
stress corrosion in NaOH at elevated temperatures in SIR, 11: 10877
stress corrosion tests in HRT mockup, 11: 9288
stress corrosion tests of, in high-temperature waters, 11: 1865, 3810
stress-rupture and fatigue, 11: 8679(R)
surface area measurement, 11: 6363
surface defects, effect of Ti on, 11: 2536
tensile and creep properties of 414, 11: 2509
tensile and elastic properties at temperatures to 1200°F and at various loading rates, 11: 3851(R)
tensile properties, effect of NH_3, water vapor, and S additions on, 11: 13779(R)
tensile properties, effects of strain rate and temperature holding time on, 11: 2925
tensile properties and radiation effects, 11: 6092
testing for sliding friction and wear, to 550°F, 11: 13728
tensile properties of rolled green strip, 11: 9749
testing of welds after thermal cycling, 11: 13090
thermal capacity, 11: 4817
thermal-cycling stresses, ability of type 347 to withstand, 11: 2532
thermal insulation, 11: 3384(J)
types, composition, properties, 11: 10889

Stainless steel (cont'd)
vapor deposition of Mo on, 11: 13782(R)
volumetric analysis for U, 11: 12345
welded to carbon steel, failure, 11: 13091
welding, 11: 8686(R), 13982(R)
welding, evaluation of seal weld joint, 11: 6371, 6372
welding, stress corrosion, and heat treatment, 11: 12456(R)
welding, tensile properties, and fracture, 11: 4883
welding, use of nitrogen atmosphere in, 11: 9735
welding technique for pipe, 11: 13884(R)
welding to Timken 16-25-6, 11: 9328
welding to Zr, 11: 8687(R)
welds, crack sensitivity of deposits, 11: 3842, 3846
welds in NaK, hardness, 11: 13113(R)
wetting by molten Pb or Bi, treatment for, 11: 3247(P)
Stainless steel (austenitic)
corrosion by aqueous reactor fuel solutions, 11: 8449
corrosion by Purex Process acid concentrators, 11: 8374
corrosion by Redox Process streams, 11: 7526, 7614
corrosion by TBP Process streams, 11: 7615
corrosion of welded specimens of, by UO_2SO_4, 11: 8708(R)
crystal structure at 1150 and 1250°, 11: 2954(J)
embrittlement by H_2 of cold-worked, 11: 1532(J)
fracture tests, effects of C, Mn, P, S, and Si, 11: 3846
grain structure effect on strength and deformation of solid solutions at elevated temperatures, 11: 1153(J)
mechanical properties at low temperatures, review, 11: 12052
preparation of Nb-stabilized, for EBR parts, 11: 1123
radiation-induced transformations in, magnetic susceptibility method for studying, 11: 8679(R)
stress corrosion cracking in HRT, 11: 4678
stress corrosion cracking of, metallographic studies and effect of austenitizing temperature, 11: 329
Stainless steel (clad)
corrosion resistance of, to attack by fuel–ash constituents, 11: 1077
dip coating with Al and corrosion by fuel–ash components, 11: 1077
Stainless steel–aluminum alloy couples
See Aluminum alloy–stainless steel couples.
Stainless steel–aluminum couples
See Aluminum–stainless steel couples.
Stainless steel–biphenyl systems
See Biphenyl–stainless steel systems.
Stainless steel–cobalt alloy couples
See Cobalt alloy–stainless steel couples.
Stainless steel couples
methods of preparation, 11: 450(R)
Stainless steel–europium oxide systems
See Europium oxide–stainless steel systems.
Stainless steel–magnesium couples
See Magnesium–stainless steel couples.
Stainless steel powders
liquid flow rates in, and corrosion, 11: 1038
rolling, 11: 9749
slip-casting for production of sintered components, 11: 4886
Stainless steel–samarium oxide systems
See Samarium oxide–stainless steel systems.
Stainless steel–tin–zirconium alloy couples
corrosion by UO_2SO_4 solutions, 11: 8911
corrosion by water, 11: 13869(R)
Stainless steel–tin–zirconium compacts
corrosion by UO_2SO_4, 11: 6348(R)
Stainless steel–titanium couples
corrosion by U–HNO_3 system, galvanic action, 11: 12317(R)
Stainless steel–uranium couples
radiation effects, 11: 11687(R)
radiation effects on interdiffusion, 11: 13199
Stainless steel–uranium(IV) oxide compacts (stainless steel clad)
corrosion by H_2- and O_2-saturated H_2O, 11: 13868(R)
specifications, fabrication, and inspection of fuel plates of, 11: 11766
uranium recovery, 11: 11618
welding methods for end capping, 11: 13078
Stainless steel–uranium oxide systems
dimensional stability under plastic deformation in tension, 11: 13930
end closure development for fuel elements, 11: 13800
polarographic analysis for U, 11: 8296(R)
radiation effects, 11: 7328(R)
Stainless steel–uranium(IV) oxide systems
drawing, 11: 13086
Standard Oil Co. of Indiana, Whiting
progress reports on development of high temperature greases, 11: 4266(R), 11155(R)
Standard reactors
See Sigma Piles.
Standards
radium, comparison of national, 11: 6569(J)
Stanford Research Inst., Menlo Park, Calif.
progress reports, 11: 12692(R)
progress reports on molten salts, 11: 3721(R)
Stannates
ferroelectric properties, theory, applications, 11: 6750(J)
Starches
reduction of UO_3 by, 11: 10502
Stars
(See also Sun.)
alpha capture reactions in He cores, 11: 3889(J)
evolution and thermonuclear reactions, 11: 8040(J), 11273
evolution of red giants through fusion reactions, 11: 11452(J)
giant, models and opacities of, 11: 8541(R)
motion of a gas during flare-up (supernova), 11: 8948(J)
nuclear reactions in later stage of stellar evolution, 11: 3888(J)
nuclear reactions with Ne isotopes in, 11: 5379(J)
origin of cosmic rays in, 11: 1935(J)
thermonuclear reaction mechanisms, 11: 1278(R)
thermonuclear reactions in, buildup from helium, 11: 11275(J)
Statistical analysis
See Statistics.
Statistical mechanics
See Mathematics; Mechanics; Statistics.

Statistics

(See also Biometry; Mathematics; Particle statistics.)

applications in analysis of health and genetic data on human populations, 11: 12635

communication theory, 11: 8025(R)

confidence intervals for the standard deviation of a normal population, 11: 8079

correlation function for systems of long-range interacting particles up to free path time, 11: 9178(J)

distribution-free tolerance limits, 11: 6455, 10632

engineering conference on, 11: 1499

for engineers, manual, 11: 10631

Gauss's theory of least squares, English translation, 11: 13386(J)

of life and fatigue tests, 11: 253

method for determining process conditions, 11: 7094(J)

notes for lectures on methods, 11: 4560

overlap of two circles, 11: 6460

of quality control, methods in, 11: 11320(J)

statistical mechanics of first-second order phase transformations, 11: 10642(J)

theoretical applications in studies of percolation in crystals, 11: 10450, 10452

uses in process control, review, 11: 5433(J)

Statitrons

See Electrostatic generators.

Steam

(See also Water vapor.)

chemical reactions with U, 11: 10498

corrosive effects on Sn alloys, 11: 11711(R)

corrosive effects on U oxides, 11: 8715(R)

corrosive effects on Zr and Zr alloys, 11: 10873

entrainment studies, 11: 7407(R)

entrainment studies, adsorption of Cs^{137} on stainless steel and pyrex, 11: 9580(R)

gamma-absorption determination in tubes, instrument for, 11: 6783

high-temperature reactions with U alloys, 11: 10499

production in reactor power plants by flashing, 11: 13868(R)

reactions with Be, 11: 12963(R)

solvent properties of superheated, 11: 8029(J)

Steam engineering

applied loading of structures, evaluation of codes for, 11: 8890

comparative performance of turbine generator sets, 11: 1028

Steam generators

See Boilers.

Steam power plants

comparative performance of turbine generator sets, 11: 1028

cost estimates for 200 Mw, 11: 2232

cycle analysis of, for nuclear plants, 11: 13311

design for reactors, 11: 7727

design of SRE, 11: 13969(R)

evaluation of types for use with HRT, 11: 2646

natural circulation steam generator system, transient dynamic analysis, 11: 10864

thermal analysis of flashing cycles, 11: 13868(R)

Steam–water systems

development and testing of separator, 11: 4354

pressure drop and critical flow for, 11: 10057

pressure drops in an annulus with heat transfer, 11: 8893

treatment of, for HRT, 11: 2109

Stearates

ring tamping with glycerol tri-, 11: 13859

Stearic acid

Borodin degradation, 11: 8258(R)

bromination, 11: 12960(R)

Steatites

insulation properties at elevated temperatures, 11: 1860(J)

Steel

(See also Boron steel; Carbon steel; Chromium–molybdenum steel; Chromium–nickel steel; Chromium–silicon steel; Chromium steel; Manganese steel; Martensites; Nickel steel; Niobium steel; Silicon steel; Stainless steel; Tungsten steel; Vanadium steel.)

abrasion by thorium oxide slurries, 11: 7412

analysis for O_2 by bromination-carbon reduction method, 11: 921

bonding to titanium and tungsten carbides, 11: 2476

boundaries and substructures, study by electron metallography, 11: 338(J)

cleaning pipes and tubing of, for nuclear coolant systems, 11: 13337

cladding with Ti, feasibility of, 11: 5875

cladding with Zr, 11: 11520(P)

coating electrokinetic process, 11: 13093(R)

coating with Cd by electrophoretic deposition of CdO, 11: 4880(R)

coefficients of friction between, on steel, 11: 10092

corrosion, bibliography on, 11: 11186

corrosion and wear, data for water-cooled reactors, 11: 12028

corrosion by B compounds in H_2O, 11: 13889

corrosion by fluorine gas at high temperatures, 11: 7184

corrosion by hot pressurized water, prevention, 11: 3248(P)

corrosion by high-temperature water, 11: 10537

corrosion by H_2S, mechanism, 11: 12466(R)

corrosion by liquid Bi-base metals, 11: 8444

corrosion by LiOH, 11: 10986(R)

corrosion by molten Bi and water, 11: 11656(R)

corrosion by Purex wastes, 11: 7734(R)

corrosion by reactor fuel solution in in-pile loop, 11: 12898(R)

corrosion by sodium at 900°F, 11: 227

corrosion by $(UO_2)_3(PO_4)_2$–H_3PO_4 systems, 11: 7458

corrosion by water, 11: 12035(J), 12068(R)

corrosion by water at 85 to 95°F, 11: 1864

corrosion in high-velocity corrosion loop, 11: 7604

corrosion in tropical environments, 11: 10538

corrosion of mild, in synthetic Redox waste solution, 11: 9723

corrosion of mild and stainless, in Redox stream IAW, 11: 7523

corrosion products on, bibliography, 11: 3817(J)

cracking in high-strength welding, 11: 5327(R)

creep and rupture stresses at high temperatures for jet applications, 11: 307

Steel (cont'd)
creep and rupture under high temperature and stress, 11: 11220(R)
decarburization when in contact with molten Na, 11: 8479
direct-stress and bending fatigue of high strength, relation between, 11: 10567
electrodiffusion of H in, retardation by surface coatings on, 11: 6422
electroplating of Cr on, 11: 335
energy absorption and cushioning characteristics of shells, 11: 6340
fatigue, alloying effects of Pb on, 11: 320
fatigue endurance of, effects of fretting-fatigue damage, 11: 302
fatigue properties, effects of complex stress-time cycles on, 11: 11240(J)
fatigue tests, applicable to propeller design, 11: 1052
fatigue tests on notched and unnotched SAE4130, with life range 2 to 10,000 cycles, 11: 5884
formation and properties of carbides in heat-treated, 11: 13348(J)
fracture, fatigue, and hydrogen embrittlement, effects of H distribution, temperature, and prepressing on, 11: 5346
fracture and welding of Ni–Cr–Mo–B, 11: 8922
friction and wear resistance in high-temperature water, 11: 12018
heat treatment and microstructure, 11: 320
high-temperature properties, 11: 5036(J)
high-temperature properties at 1200 to 1700°F and above, 11: 4881
high-temperature rupture strength, effects of Mo, W, and V on, 11: 1168(J)
hydrogen absorption, embrittlement, and fracture, 11: 9334(J)
hydrogen embrittlement effect on mechanical properties of, review, 11: 13801
hydrogen embrittlement effects on fatigue in, 11: 10568
hydrogen transport in, due to an electric field, 11: 10570(J)
impact strength, 11: 8605
lubrication, evaluation of dry film for, 11: 7981
manual welding procedure for a pressure vessel closure of, clad with stainless steel, 11: 2499
mechanical properties and heat and corrosion resistance, effect of rare earth additions on, 11: 1911(J)
mechanical properties and weldability of pressure-vessel, 11: 4853(J)
mechanical properties of aircraft structural, data, 11: 1051
mechanical shock resistance and temperature effects to −65°F, 11: 336
mechanical shock resistance of elastic-plastic beams, 11: 2549
mild, corrosion in neutralized solutions and fused salt products, 11: 11147(R)
neutron attenuation, 11: 4658
properties, radiation effects on, 11: 12930
protective coatings for, testing, 11: 3385(R), 3386(R)
radiation effects, 11: 1922(R), 4161, 4739
radioactivity induced in, by reactor irradiation, 11: 13200
radiographic inspection, dosage calculator for γ sources, 11: 483
radiographic inspection, use of Cs^{137} as γ source, 11: 4449
radiography, 11: 11311(J)
rupture discs, effects of gaseous detonation on, 11: 1541
shielding properties, effects of B additions on, 11: 7891
spectrographic analysis for O_2, 11: 11091(J)
stress and creep at elevated temperatures, relationship between, 11: 7201(J)
structural, effect of complex alloying on wear resistance, 11: 9336(J)
structural, effect of neutron irradiation on mechanical properties, 11: 9507(J)
structure changes under stress of Ni–Cr–Mo, 11: 1147(J)
structural response of vessels of, to shock-pressure loading, 11: 11171(R)
tensile and creep properties of 18-4-1 tool, 11: 2509
tensile and elastic properties at temperatures to 1200°F and at various loading rates, 11: 3851(R)
testing, methods and evaluation, 11: 12020
testing for naval reactor pressure vessels, 11: 12605
testing for sliding friction and wear, to 550°F, 11: 13728
thermal capacity, 11: 4817
thermal stresses subjected to rapid heating, 11: 7867
transport and deposition of radioactivity in static autoclave, 11: 11177
ultra-high-strength, electroplating with Cd, embrittlement reduction, 11: 5888
wear resistance at 600°F, 11: 5896
welded, notch toughness tests for, relative behavior of, 11: 8938(J)
welding of heavy plate, 11: 1912(J)
welding SAE 4130, 4140, and 4340, filler wires for, 11: 8010(R)
x-ray investigation of deformation and bond strength in crystal lattice, 11: 5328(J)

Steel (clad)
corrosion of Cr-clad steel in 300 to 650°F H_2O, 11: 13751
fracture and ductility of Cd, Cr, Zn plated, effect of heat treatment, 11: 317
thermal expansion stresses in spherical carbon steel shell clad with stainless steel, 11: 8559

Steel couples
See Stainless steel couples.

Steel wool
thermal conductivity measurements in air, 11: 8542

Stellite
See Cobalt alloys.

Sterility
of mouse ovaries caused by x irradiation, evidence for chemical protection, 11: 11046(J)

Sterilization
(See also Radiosterilization.)
radioinduced, in agriculture, medicine, and in pharmaceutical and food industry, review, 11: 3293(J)

Steroids
biosynthesis, tracer studies using labeled cholesterol, 11: 13229(R)
paper chromatography, 11: 9591(R)
physiological effects on mice, 11: 4226(R)
radiation chemistry, 11: 960(J)

Stilbene crystals
production method for phosphor, 11: 3636(P)
scintillation decay times, measurement, 11: 517(J)

4,4′-Stilbenedicarboxamidine
metabolism, 11: 9591(R)

4,4′-Stilbenediol, α,α'-diethyl-
metabolism and physiological effects in lambs, tracer study, 11: 11021(R)

Stibines
See Antimony hydrides.

Stills
See Distillation apparatus.

Storage batteries
design of, utilizing radioactive isotopes, 11: 7395(P)

Storage tubes
See Memory devices.

STR
See Bulk shielding facility; Submarine Thermal Reactor.

Straight Tube Aircraft Reactor (STAR)
See Aircraft reactors.

Strain gages
(See also Extensometers.)
design and performance, 11: 2575
design of direct optical, for irradiated metals, 11: 5415(J)
design of electrostatic, 11: 12123(J)
efficiency, brittle coatings to increase, 11: 2457
properties of bonded-wire, 11: 8548(R)
testing equipment at elevated temperatures, 11: 8679(R)
waterproofing techniques for, and associated wiring, 11: 456

Stress analysis
(See also Mechanics.)
book, 11: 10108
brittle-lacquer method, 11: 2457
buckling of composite elements, 11: 11151
buckling of flat plates, 11: 11150
compressive strength of flat stiffened panels, 11: 11154
of curved plates and shells, 11: 11152
design charts for, of circular plates with control holes, 11: 10065
of elastic rings, 11: 12802
equations for the conditions of plasticity, 11: 6464
flanged shell joints and bolt failure, 11: 2545
graphical method for, of plates and thin-walled tubing, 11: 10566
of hexagonal, webbed matrices, 11: 13936
mechanical and thermal, techniques for, 11: 12242
of plates and composite elements, 11: 11153
pressure vessel for S3G reactor, 11: 13051
of Savannah River Reactor tanks, 11: 9830
of shells and shell-like structures, bibliographies, 11: 10511

Stress and strain
See Materials testing; Mechanics; Thermal stresses.

Stress corrosion
cracking in stainless steel, metallographic studies, 11: 329
measurement and evaluation, 11: 12020
testing equipment, 11: 7859(R)
tests of stainless steels in high-temperature waters, 11: 1865
of titanium alloy weldments at 700°F, 11: 12067(J)

Strong focusing
See Alternating-gradient focusing.

Strontium
bone deposition, 11: 13565(R), 13566(R)

Strontium (cont'd)
bone deposition, effect of sulfate, acid phosphate, phosphate ions, and Sr concentration, tracer study, 11: 7398(R)
bone deposition, tracer study, 11: 3679, 5179(R), 9576(R), 12960(R)
bone deposition in humans, 11: 12637(J)
bone deposition in rats, 11: 12959(R)
chemical separation from Y, 11: 7440(R)
comparative metabolism with Ca, double tracer study in rats and rabbits, 11: 8816(J)
coprecipitation on a $BaSO_4$ carrier from 5M HNO_3, 11: 10473(R)
coprecipitation with alkaline earth sulfates and ion exchange, 11: 9255(R)
determination in milk ash, 11: 7954(J)
dietary intake and bone deposition in humans, 11: 2237(R)
diffusion from U-impregnated graphite, 11: 12982
flame photometric determination, 11: 12973(R)
ion exchange and determination in milk and bone ash, 11: 5255
ion exchange behavior on Dowex-50, 11: 5276(J)
isotopic and nonisotopic carriers, influence on Sr^{90} behavior in rat, 11: 12654(J)
isotopic equilibration determination, 11: 7113(J)
metabolism and bone deposition, tracer study, 11: 3680(J), 12639(R)
metabolism and pathological effects in dogs, 11: 5133(R)
metabolism and tissue distribution in humans, 11: 4257(J)
metabolism by plants and animals, relation to calcium incorporation, 11: 11888(J)
metabolism following dietary administration to man, tracer study, 11: 11049(J)
metabolism following oral administration, tracer study employing Sr^{90}, 11: 7929(J)
metabolism in fish, tracer study employing Sr^{89}, 11: 6224(J)
metabolism in rats, 11: 8258(R)
metabolism in vertebrates, 11: 10803(R)
polarographic determination, 11: 11943(J)
radiochemical separation, 11: 179
radiometric determination in water, 11: 8870
removal from aqueous solutions, 11: 3237(P)
removal from radioactive waste solutions, 11: 1026
separation and determination in fission-product solutions, 11: 115(J)
separation by ion exchange from fission product wastes, 11: 10473(R)
separation procedures, tracer study, 11: 7113(J)
tissue distribution in rats following intraperitoneal injection and peritoneal lavage, tracer study using Sr^{85}, 11: 9979(J)
uptake by plants and animals, tracer studies, 11: 9576(R)

Strontium compounds
formation and high-temperature properties of $SrO_3 \cdot 3BeO$, 11: 4428(J)

Strontium isotopes
chemical effects on tissues and metabolism in animals, 11: 7055(J)
effect on food chains, 11: 56(J)
hydraulic and ion-exchange behavior in underground movements, 11: 1026
isotopic analysis with aluminum ion emitter, 11: 126(J)
neutron reactions (n,p), relative sections, 11: 5561(J)
radiometric determination of Sr^{89} and Sr^{90} in soil, bone, vegetation, and liquids, 11: 928

Strontium isotopes (cont'd)

search for, in U fission, 11: 2969(J)

toxicology of Sr^{85} and Sr^{90}, 11: 893

Strontium isotopes Sr^{85}

excretion, effects of rhodizonic acid and tetrahydroxyquinone, 11: 12642(R)

low-energy quanta from, coincidence arrangement for detection, 11: 1595(J)

radiometric determination in human subjects by external counting, 11: 7291(R)

Strontium isotopes Sr^{86}

gamma reactions (γ,n), cross sections, 11: 3037(J)

Strontium isotopes Sr^{87}

gamma reactions (γ,n), cross sections, 11: 3037(J)

Strontium isotopes Sr^{88}

energy levels following Rb^{88} decay, 11: 8286(R)

gamma reactions (γ,n), cross sections, 11: 3037(J)

Strontium isotopes Sr^{89}

diffusion from U-impregnated graphite, 11: 7711

maximum permissible concentration in air, 11: 2238

monitoring in fish by external counting, 11: 1257(J)

radiometric determination, 11: 6277(J)

rate of entry into plants from soil, 11: 11033(J)

yield in thermal neutron fission of U^{235}, 11: 12254(J)

Strontium isotopes Sr^{90}

(See also Sunshine Project.)

applications in β sources for therapeutic uses, 11: 4258(J)

as beta source for phosphor activation, 11: 10183(J)

biological hazards from, in fall-out, 11: 6618(J)

bone deposition, 11: 10803(R), 11877(R)

bone deposition in animals, 11: 1725(R)

bone deposition in rats following bone fracture, 11: 7695(R)

contamination level in marine animals and land plants following fall-out, 11: 9192

detection and measurement in plants, 11: 11048(J)

determination in samples collected throughout the world, 11: 3480, 4795

determination in H_2O, 11: 1026

distribution in North Atlantic surface water, 11: 9960(J)

extraction from fission product solutions, 11: 3367(J)

hazards from environmental, 11: 11884(J), 13249(J)

incorporation into skeletons of growing children, 11: 11909(J)

ion exchange concentration in water, 11: 1592(J)

ion-exchange concentration in water to determine activity, 11: 1592(J)

maximum permissible concentration for man, 11: 4257(J)

maximum permissible concentration in air, 11: 2238

metabolism, after ingestion in plant material by rats, 11: 12961(R)

metabolism by plants and animals, effects of dietary Ca and various chemical agents, 11: 2233(R)

metabolism in monkeys, 11: 5747

monitoring of levels of, in soils, vegetation, bones, and milk due to fall-out from nuclear explosions, 11: 9201

neutron reactions and decay, 11: 12240(R)

Strontium isotopes Sr^{90} (cont'd)

pathological effects, metabolism, and bone deposition in dogs, 11: 11019(R)

pathological effects in dogs and cats, 11: 7910(R)

permissible daily allowable intake of, for humans, 11: 2237(R)

permissible limits, revisions in computation, 11: 2234

plant metabolism, 11: 11877(R)

polarization of electrons emitted by, 11: 10355(J)

radiation dosage determinations, 11: 6574(J)

radiation dosage determinations for, deposited in bones of young rabbits, 11: 2983(J)

radiation dosage determinations from, deposited in fall-out, 11: 3295

as radiation source in medical radiography, 11: 7078(J)

radiometric determination, 11: 11148

radiometric determination in biological materials, 11: 3690, 4257(J), 5171

radiometric determination in biological materials, filters, soils, and water, 11: 6612, 6613

radiometric determination in samples of bone and milk collected in Canada in 1956, 11: 5172

radiometric determination in samples of soil, vegetation, bones, and milk, 11: 46

radiometric determination in the presence of Y^{90} and Ca^{45}, 11: 7398(R)

rate of entry into plants from soil, 11: 11033(J)

recovery from radiochemical wastes, 11: 12718

removal from wastes before ground disposal, 11: 5292(J)

retention and excretion in monkeys, 11: 11881(J)

separation of carrier-free Y^{90} from Sr^{90} by electrolysis, 11: 8876(J)

soil contamination due to fall-out from nuclear tests, 11: 884(J)

tissue distribution in adult, young, and infant monkeys, 11: 4227(R)

toxicity in dogs and mice, 11: 12642(R)

Strontium isotopes Sr^{91}

yield in thermal neutron fission of U^{235}, 11: 12254(J)

Strontium isotopes Sr^{92}

decay properties, 11: 1276(R), 5672(J)

Strontium oxides

electron-bombardment-induced dissociation, 11: 8217(J)

formation in UO_2 drossing of irradiated U, equilibrium constants and free energy values, 11: 5260

Strontium phosphates

luminescence of modified tin-activated, 11: 9221(J)

Strontium sulfates

solubility, 11: 12970(R)

solubility in UO_2SO_4 solutions, 11: 8383(R)

solubility in H_2O and HNO_3, 11: 4430(R), 9255(R)

Strontium titanates

breakdown voltage, 11: 261(J)

monocrystals, method of preparation and properties of, 11: 3335(J)

preparation and dielectric and optical properties of solid solution of, 11: 1066(J)

Structural columns

creep, variational theorem for, 11: 8005

Structural materials
See Building materials.

Structural panels

(See also specific panels, e.g., Plates and Windows.)

compressive strength of flat stiffened, 11: 11154

design for control of contamination, 11: 7960

stainless steel and titanium sandwich, for aircraft, 11: 12748

stress testing sandwich structures, 11: 13315

Structures

(See also specific structures, types of structures, and structural members by name.)

blast effects, bibliography, 11: 4484

buckling, 11: 11153

damage from low-velocity missiles resulting from nuclear explosions, 11: 2774

deflection equations for various loadings of circular-arc curved beams, 11: 6798

effects of blast from atomic explosions on mobile homes, 11: 11830

mechanical properties of aircraft, at high temperatures, 11: 1506

radiation protection from fall-out by standard housing, 11: 9203

shielding properties of standard Navy barracks, 11: 6210, 12652

temperature effects on aircraft, testing, 11: 1505

Styrene polymers

with butadiene, vacuum forming, 11: 4850

post-irradiation oxidation, 11: 965(J)

radiation effects, 11: 4350(J), 5246

refractive index, method of measuring, 11: 10371(J)

Styrenes

bromination, 11: 12970(R)

Submarine Advanced Reactor

airborne activity between pressure vessel and primary shield tank, 11: 13931

cold water accident analysis, 11: 13154

control element, design of Zircaloy-clad, burnable poison type, 11: 10733

control element cooling by convection flow, 11: 2704

control element materials, fabrication of samples for critical assembly tests, 11: 12742

control rod dimensional stability, hafnium, 11: 11750

control rod fabrication, 11: 11706

control rod materials, effect on crud level and activity, 11: 12235

coolant demineralization in, tests on demineralizers for, 11: 5021

coolant flow, analysis of hydraulic transients, 11: 12893

coolant radioactivity, MTR loop studies, 11: 13502

coolant sampling system for determining gas and H content in coolant, 11: 4092

cooling system pressurization, performance of Greer hydraulics accumulator, 11: 3790

cooling system stress analysis, 11: 12237

design of ship service electric power and control systems, 11: 9477

equipment, testing of unit cell transition joint, 11: 10861

evaporators, testing of welds for, 11: 13090

fuel element endurance-testing, 11: 10965

fuel element fabrication, 11: 9475

fuel element mechanical testing, 11: 10956, 10964

heat generation, interchannel mixing in the S3G, 11: 12568

Submarine Advanced Reactor (cont'd)

high-temperature purification of primary water, 11: 3555

instrumentation for emergency cooling test loop, 11: 13155

instrumentation welding procedures, 11: 8172

isolation valve design and testing for cooling system, 11: 13151

isolation valve testing, 11: 12234

mockups, composition and geometry of, 11: 13157

neutron flux measurements by activation of Cu and Mn, 11: 10286

nondestructive testing for fuel placement, 11: 13950

nucleate boiling effects, 11: 11795

outline of radioactivé accessiblity problem, 11: 2706

primary coolant impurity activation and demineralizer shielding, 11: 10957

reactivity effect of neutron injection into FPR, 11: 11417

seal weld to standpipe housing, 11: 6737

steam generator system, steady-state dynamic analysis of, 11: 13948

steam generator system transient analysis, 11: 10864

stress analysis of pressure vessel for, 11: 13051

thermal gradients and stresses in standpipe, 11: 3556

thermal stresses in lower pressurizer walls during start-up, 11: 9476

transient temperature curves for carbon steel walls, 11: 10863

Submarine Boiling Reactor

See Boiling reactors.

Submarine Fleet Reactor

coolant purification system, 11: 3080

thermocouple brazing techniques, 11: 8004

Submarine Intermediate Reactor

adhesives for static seals of rotating plugs, 11: 11789

cleaning Na from heat transfer system with ethylene glycol, 11: 2442

connection in narrow vertical liquid metal annuli, 11: 2435

control element bearing tests, 11: 13153

coolant flow control, 11: 10955

coolant flow in, meter design for measuring, 11: 13932

cooling system, plugging tests on rotating plug simulator in, 11: 12567

cooling system bellows, testing in Na, 11: 4920

cooling system stop valve freeze seal evaluation, 11: 3553

corrosion of stainless steel in NaOH at elevated temperatures, 11: 10877

cracking of rotating plug shield on can welds, 11: 2705

decontamination procedure, research program for a Na flush, 11: 13156

design and development, 11: 13149(R)

disconnect unit, thermal shock testing, 11: 12559

Doppler effect and self shielding, 11: 13879

evaporators, maintenance of, 11: 13089

forced convection flow in open-ended annulus, 11: 2439

fuel element dimensional stability, 11: 13162

fuel processing, corrosive effects of solutions in, 11: 8457

heat conductivity of shot in rotating plugs of, 11: 12558

heat transfer systems, 11: 227, 3783(R), 4407(R), 6700(R)

liquid metal level indicator instrument, 11: 452

Lummus condenser tubing corrosion, 11: 10960

off-on control of, engineering study, 11: 13159

pressure resonance in fluid-filled cavities, 11: 2441

Submarine Intermediate Reactor (cont'd)
primary coolant stop valve, sodium acceptance tests, 11: 12560
seals and seal lubricants to control gas leakage, 11: 11788
shield design, 11: 11821
stop valve bellows in Na system, evaluation of welds, 11: 3554
temperature and thermal stresses in Be of fuel element core rod, 11: 12562
temperature distribution in cooling system, 11: 6897
testing of rotating plugs with hot Na, 11: 13933
uranium and uranium oxide distribution in cooling system after fuel pin failure, 11: 12564
Submarine Intermediate Reactor Experiments
multigroup analysis of PPA-19, 11: 13934
neutron absorption in plane thermal absorbers, 11: 12563
Submarine power plants
emergency cooling of, limiting ship's attitudes, 11: 12896
impact shock, theory and mathematics, 11: 228
Submarine Reactors (S1C)
shield design studies, 11: 13889
Submarine Reactors (S5W)
condensate pot performance, 11: 12446
coolant pressurizing system, 11: 12613
Submarine Thermal Reactor
coolant processing of, ion exchanger for, 11: 5029(R)
coolant radioactivity, particulate corrosion products from high power run, 11: 12604
cooling system, thermal connection system, 11: 2729
fuel processing, corrosive effects of solutions in, 11: 8457
in-pile tests of compensated ion chambers for neutron flux measurements, 11: 2548
monitoring equipment, evaluation, 11: 12516
Submarine Thermal Reactor(Mark I)
control element corrosion, 11: 13995
elevated temperature tests on BF_3 proportional counter and instrumentation, 11: 2614
fuel element corrosion, effect of test conditions, 11: 13760
heat transfer, cyclic variation of power for determination of film coefficient variation, 11: 13722
Submarine Thermal Reactor Critical Experiment
control rod calibration, 11: 13864(R)
control rod design, criticality studies, neutron flux, poisoning, radiation from, and shielding, 11: 9870
criticality studies, after loading with G.E.-type fuel elements, 11: 7722
Subsonic flow
(See also Supersonic flow.)
heat transfer and hydrodynamic characteristics, 11: 11817
Sucrose
paramagnetic resonance in, 11: 12069
Sulfamates
(See also Iron sulfamates.)
gasometric determination in the presence of foreign ions and diluents, 11: 2266
Sulfamic acid
decontamination by titrating with sodium nitrite, 11: 8380(R)
Sulfamic acid (cont'd)
use in Redox Process, 11: 7533
Sulfate complexes
aluminum nitrate effect on, in UO_2 solutions, 11: 13564(R)
Sulfates
(See also sulfates of specific elements.)
coloration and luminescence, 11: 5376(J)
determination in uranyl sulfate, 11: 2332
spectrophotometric analysis for U, 11: 2832
spectrophotometric determination in $Th(NO_3)_4$, 11: 10812(R)
thermoluminescence, 11: 7220(J)
titrimetric determination, 11: 2828
titrimetric determination in acid solutions, 11: 2836(J)
Sulfex–F Process
(Head end process for the dissolution of U–Zr fuels by H_2SO_4–Hf.)
flowsheets, 11: 11969
Sulfhydryl group
See Mercapto group.
Sulfide crucibles
(See also Cerium sulfide crucibles.)
fabrication from Ce_2S_3, 11: 7176
performance for melting Ce, 11: 10870
preparation, 11: 11690(R)
Sulfides
aromatic, absorption spectra, 11: 4813
coloration and luminescence, 11: 5376(J)
determination of standard molar free energy of formation of metal, 11: 6235
interaction between thiols and disulfides, 11: 5771(J)
metal, voltages in fused alkaline metal chlorides, 11: 11925(J)
minerals associated with pitchblende, U content, 11: 4440(R)
phosphors, excitation mechanisms, 11: 417(J)
voltages for colored metals in fused chlorides of alkaline metals, 11: 11925(J)
Sulfinic acids
analysis, preparation, and purification, 11: 2406
Sulfites
chemical reactions of HSO_3^- and SO_2 with BrO_3^-, 11: 6631
Sulfonamides
titration in acetone using tetra-alkyl ammonium hydroxide, differentiating, 11: 8846(J)
Sulfonic acids
azoxine derivatives as indicators in complexometric titrations of Cd, Co, Cu, Pb, Ni, Th, rare earths, 11: 6261(J)
Sulfonium compounds
radiation chemistry, 11: 12642(R)
Sulfur
cooling properties for fast reactors, 11: 8682
as corrosion inhibitor when admixed to oils, tracer study, 11: 279(J)
gamma reactions (γ,π^-), 11: 4115
gravimetric determination in molybdenite, 11: 11586(R)
neutron activation determination, 11: 12973(R)
neutron reactions, effect on gas formation, 11: 3577
neutron reactions (n,p), energy distribution of protons from, 11: 5623(J)
neutron total cross sections, 11: 1287, 10229

Sulfur (cont'd)
protons scattered at 96 Mev by, energy spectrum, 11: 612(J)
radiation detectors using, 11: 2757
radiochemical determination in HRT fuel solution, 11: 12343
radiometric determination in hydrocarbons, 11: 7116(J)
reactions with $(C_5H_5)_3Mn_2(NO)_3$, 11: 89(J)
reactions with methylborine, 11: 3368(R)
separation from radioactive P, 11: 5097(P), 6582(P)
separation of P from irradiated, by solvent extraction, 11: 9528(P), 9529(P)
spectrophotometric determination of trace amounts in fluoride salts, 11: 11081

Sulfur compounds
chemistry and spin-resonance spectroscopy of thioaromatic radicals, 11: 3356
physiological effects on mice, 11: 4226(R)

Sulfur dioxides
for leaching U ores, aqueous Fe^{3+} or Mn solutions, 11: 5706

Sulfur–iron systems
See Iron–sulfur systems.

Sulfur isotopes
abundance in sulfide materials, 11: 5374(J)

Sulfur isotopes S^{32}
deuteron reactions (d,α), and energy levels of P^{30}, 11: 3038(J)
deuteron reactions (d,p) and energy levels of S^{33}, 11: 2095(J)
energy levels, 11: 1542(R), 1673(J)
neutron scattering resonances at 585-kev, 11: 2026(R)
proton reactions (p,γ), 11: 6122(J)

Sulfur isotopes S^{33}
energy levels, 11: 12186(R)
excited levels studied by $S^{32}(d,p)S^{33}$ reaction, 11: 2095(J)

Sulfur isotopes S^{34}
energy levels, 11: 1542(R)
fractionation in nature, 11: 10155(J)

Sulfur isotopes S^{35}
beta spectra, 11: 13394(J)
beta spectra, calorimetric determination of energy, 11: 12940(J)
bone deposition, 11: 7695(R)
deposition in organs and tissues of human adults and young and adult rats, tracer study, 11: 9978(J)
determination in biological materials, 11: 13275(J)
formation in neutron-irradiated foodstuffs, 11: 5733
measurement of P^{32} impurity in, 11: 1993(J)
produced by cosmic rays in rain water, 11: 3447(J)
quantitative measurement in biological samples, 11: 3490(J)
radiation dosage determinations in tissue, 11: 3479(R)
radiometric determination in the presence of C^{14} in blood samples, 11: 1778(J)

Sulfur isotopes S^{36}
nuclear properties, 11: 7091(R)
search for, 11: 4814(R)

Sulfur minerals
isotopic ratios in, variations of S^{32}/S^{34}, 11: 7997(J), 8001(J)
paragenesis and genesis relationships, 11: 7997(J)
radiometric analysis of cylindrite for In, 11: 11936(J)
x-ray-fluorescence analysis for Cu, Fe, Pb, and Zn, 11: 4824

Sulfur trioxide–uranium(VI) oxide–water systems
phase studies, 11: 9587(R)

Sulfur trioxides
vapor-liquid phase of H_2O–SO_3 at 20 to 200°C, 11: 919(J)

Sulfuric acid
acidity function, temperature and concentration dependence, 11: 4268(J)
activation and passivation of stainless steel in, 11: 9338(J)
analysis for N_2 and nitrites, 11: 12973(R)
corrosive effects, 11: 6536(R), 12585(R)
corrosive effects on HRT materials, 11: 4692(R)
corrosive effects on metals and alloys, 11: 8457
corrosive effects on Ni, 11: 4432
corrosive effects on stainless steel at 150°C, 11: 10875
corrosive effects on Ti and Ti alloys, 11: 7185
ionization, 11: 10438(J)
polygraphic analysis for Ti and Nb in solutions of, 11: 12678(J)
preparation of D-labeled by dissolution of SO_3 in D_2O, 11: 7978
radiation and temperature effects, 11: 9587(R)
radiation chemistry, 11: 7455(R)
radiolysis by pile irradiation, 11: 12330(R)
reaction kinetics with MgF_2 and CaF_2, 11: 10812(R)
reaction with UF_6 for preparation of uranium(VI) sulfate, 11: 10495
solvent properties for Ti, Hf, Zr, and Th, 11: 4470(J)
solvent properties for Zircaloy-2 catalyzed by HF, 11: 12663
solvent properties for Zr, 11: 12966(R)
sorption on ion exchange resins, 11: 8284(R)
vapor-liquid phase studies, 11: 919(J)

Sulfuric acid–copper sulfate–uranyl sulfate systems
See Copper sulfate–sulfuric acid–uranyl sulfate systems.

Sulfuric acid–hydrofluoric acid systems
See Hydrofluoric acid–sulfuric acid systems.

Sulfuric acid–nitric acid systems
See Nitric acid–sulfuric acid systems.

Sulfuric acid–uranyl nitrate systems
corrosion effects on 347 stainless steel, effects of Al-inhibited fluoride on, 11: 7620

Sulfuric acid–uranyl sulfate systems
decontamination of, by CaF_2 adsorption of rare earth fission products, 11: 11662
phase transitions, effects of $NiSO_4$ and $CuSO_4$ additions on, 11: 13692
solubility of rare earth sulfates in, 11: 8382(R)

Sun
(See also Stars.)
acceleration of cosmic radiation in solar flares, 11: 12775(J)
magnetic field and current configurations, 11: 1930(J)
production of Be, Li, and D in outer layers, mechanism, 11: 8192(J)

Sundance formation (Wyo.)
radioactive deposits in, 11: 3830(J)

Sunshine Project

(See also Fall-out; Strontium isotopes Sr^{90}.)

amended 1953 report, 11: 8789

analysis of biological samples for Sr^{90} content, 11: 3690

function in world-wide fall-out monitoring, 11: 11884(J)

strontium^{90} concentration data on samples collected throughout the world, 11: 6612, 6613

Superconductivity

interactions between electrons and waves in, 11: 9350(J)

Superconductors

magnetic properties not based on macroscopic heterogeneities, review, 11: 8036(J)

Supercritical water
See Steam; Water; Water vapor.

Supercritical Water Reactor (ANP)
See ANP Reactor (SCW).

Superlattices
See Crystal structure.

Supersonic flow

(See also Subsonic flow.)

mathematical analysis of, past circular cylinder, 11: 9280(J)

non-stationary wing motion in, 11: 6336(J)

resistance related to lifting force produced in, 11: 245(J)

water jet flow 600 to 650 m/sec under 2000 atm., 11: 6337(J)

Supersonic inspection
See Sonic inspection.

Supo
See Los Alamos Water Boiler.

Surface-active agents

(See also Flotation reagents.)

prevention of emulsions in Slurex extractions using, 11: 9644

Surface bursts (atomic)
See Atomic explosions.

Surface defects
See Fluorescent penetrant inspection.

Surface friction

coefficients of, between dry metallic surfaces, 11: 10092

fatigue in Cr–Ni–Mo, 11: 8014(J)

and heat transfer in finned annuli, 11: 5912

Surface reactions

involving He metastable atoms and resonance photons, 11: 11295(J)

Surface tension

measurement device for Hg-like materials in high purity enclosures, 11: 1010(J)

Surface waters

analysis for U, 11: 3343(J)

circulation patterns studied by tritium contents, 11: 2220

radioactivity, 11: 6963

radiological monitoring, 11: 1498

radiological monitoring procedures, 11: 6817

Surface waters (cont'd)

radiometric analysis for Sr^{90}, 11: 6612, 6613

uranium content in Baltic Sea Basin, 11: 4869(J)

Surfaces

area measurements by low temperature adsorption of ethylene, construction and calibration of apparatus for, 11: 10146

bonding of adhesives and protective coating to metal, 11: 5302

cleaning of glass and metal, using gas discharge, 11: 8059(J)

curved, design of gage for measuring, 11: 3635(P)

gas clean-up, 11: 2959(J)

Survey meters
See Radiation detection instruments; Rate meters.

Suspensions

(See also Colloids; Slurries.)

elastic and thermoelastic properties, 11: 3881(J)

flow characteristics, 11: 1036

fluid motion effects on interfacial areas, 11: 1852(J)

Sweden

fall-out monitoring between July and Dec. 1956, 11: 13246

Swedish Reactor
See SLEEP Reactor.

Swimming pool reactors

(See also Air Force Engineering Test Reactor; Bulk Shielding Facility; LIDO; Michigan Research Reactor; ORNL Research Reactor; Pennsylvania Research Reactor.)

bibliographies of ORNL-BSF reports pertinent to, 11: 12587

characteristics of, in Trombay, India, 11: 7335(J)

critical masses, neutron flux distribution, and adjoint functions of Pool Test Reactor, 11: 6528

criticality data for Geneva Conference Reactor, 11: 13927

criticality studies, 11: 2663

description of proposed Delft, Holland, 11: 11440(J)

design, 11: 10715

design and construction of Battelle research, 11: 2775(J)

design and operation, 11: 591(J)

design and use of PTR (Pool Test Reactor) in Canada, 11: 13(J)

fuel element fabrication and radiation testing, 11: 12456(R)

fuel element testing for Geneva Reactor, 11: 1618(R)

fuel plate fabrication, UO_2–Al–Al clad, 11: 13914

MERLIN (medium energy research), design, 11: 3563(J)

neutron leakage calculated for north face of Bulk Shielding Reactor, 11: 11754

operating characteristics, 11: 1666(J)

at Trombay, design and experimental facilities, 11: 3561(J)

underwater lighting systems for, 11: 672(J)

Swine

handling during in vivo monitoring of thyroid gland, 11: 6471

immobilization, 11: 2242(R)

Sylphons
See Bellows.

Sylvania Electric Products, Inc. Atomic Energy Div., Bayside, N. Y.
progress reports on diffusional bonding, 11: 6389(R)
progress reports, 11: 12499(R)
progress reports on fundamentals of sintering, 11: 6390(R)

Sylvania Electric Products, Inc., Bayside, N. Y.
progress reports on Ti and Ti alloys, 11: 1526(R)

Synchrocyclotrons
beam extraction near the maximum energy, effect of regenerator, 11: 1358
beam utilization, 11: 3185(J), 5643(J)
construction of CERN, 11: 11255(R)
design of 680-Mev proton, 11: 5642(J)
design of USSR 6 meter, 11: 3185(J)
ejector, 11: 3185(J)
extraction of high-energy particle beams through electromagnet yoke, 11: 9147(J)
non-linear effects in spiral-ridge, 11: 7341
operation of Nevis neutron velocity selector, 11: 551
radiofrequency system for 680-Mev, and for 600-Mev CERN, 11: 3185(J)
regenerative deflector system, 11: 12282(J)

Synchrometers
See Mass spectrometers.

Synchroscopes
See Oscillographs.

Synchrotrons
(See also Brookhaven Synchrotron.)
achromatic injector for Saclay proton, 11: 3185(J)
beam controlled acceleration, 11: 3185(J)
beam losses from gas scattering in proton, 11: 3103
beam structure of the Birmingham proton, 11: 5637(J)
construction of CERN proton, 11: 11255(R)
curvature effects in CERN proton, 11: 3185(J)
design and instrumentation studies on Argonne 12.5-Bev proton, 11: 1355(R)
design and research programs, 11: 4725(J)
design feasibility of a multi-Bev circular electron accelerator, 11: 3108
design of billion volt, 11: 12251(J)
design of Cornell Bev, 11: 9146
design of 3-Bev high intensity, 11: 3185(J)
design of 10-Bev proton, 11: 5644(J)
design parameters and particle orbits for 6.5-Bev spiral ridged, 11: 3104
design parameters and theory for Bev proton, 11: 550(R)
design study for 12-Bev constant-gradient proton, 11: 7342
design of CERN Alternating Gradient Proton Synchrotron for use in magnet formation, 11: 1356
design with double vacuum chamber, 11: 3185(J)
development at Cambridge, 11: 1542(R)
donut development, 11: 10329

Synchrotrons (cont'd)
electromagnet block tests, Saclay, 11: 8200(J)
electromagnet for AG, 11: 3185(J)
electron optical emissions in, angular distribution of intensities and polarization, theory, 11: 3454(J)
electron oscillations in, method of measuring, 11: 12919(J)
electron oscillations in, stochastic theory, 11: 1556(J)
electron oscillations induced by radiation, strong focusing attenuation, 11: 1208(J)
electronic system of 10-Bev proton, 11: 3185(J)
energy distributions of electron emission in 150, 225, and 250 Mev with spectra from 4000 to 6100 A, 11: 1947(J)
field stabilization in, with a-c—d-c magnets, 11: 5636(J)
focusing region and scattering in electron, 11: 3185(J)
free oscillations in, radiation effects on, 11: 9500(J)
high-intensity, alternating-gradient, proton, proposal, 11: 9189(R)
injection problems, 11: 3185(J)
linear accelerator injectors for proton, 11: 3185(J)
magnet studies, electronic equipment, and vacuum systems for Argonne, 11: 8199(R)
magnetic characteristics of 10-Bev proton, 11: 3185(J)
misalignments in FFAG beam, 11: 1674
motion of relativistic electrons in, 11: 3185(J)
non-linear orbit problems, 11: 3185(J)
operating in the energy range above 1000 Mev, description, 11: 732(J)
operation, 11: 21, 6596(R)
operation of Birmingham proton, 11: 3185(J)
operation of Purdue 300 Mev electron, 11: 12916(R)
oscillations, linear theory of, particle losses during acceleration and tolerance theory, 11: 12918(J)
particle dynamics of spiral-ridged, effect of straight sections on, 11: 13525
particle orbits in FFAG, equations for, 11: 716
phase oscillations induced by radiation fluctuations in, nonlinear theory, 11: 10331(J)
properties of Argonne 12-Bev proton, 11: 3185(J)
proton injection by ion dissociation, 11: 3185(J)
radiation resonance, 11: 4143(J)
resonance lines, 11: 3185(J)
storage-ring, 11: 3185(J)
theory of spiral-ridged, with straight sections, 11: 13526
two-target operation technique, 11: 5639(J)

Synthesis
See Biosynthesis.

Synthetic rubber
See Elastomers.

Syracuse Univ., N. Y.
progress reports on titanium, 11: 1138(R)

Szilard-Chalmers reactions
neutron detection using, 11: 4572(J)
in potassium cobalticyanide, 11: 8834(J)
ejection problems for CERN proton, 11: 3185(J)

T

Tables
See Constants and conversion factors; Mathematical tables.

Tampers
See Reactor reflectors.

Tanks
(See also Dissolvers; Pressure vessels; Vehicles; Vessels; Waste disposal.)
design for storage of radioactive wastes, 11: 1026, 2417, 3803, 5852(J)
design of dump for HRT, 11: 2651, 2652
nuclear safety of elliptical and annular cylindrical, comparison, 11: 184
stress analysis of Savannah River Reactor, 11: 9830
testing of HRT blanket dump and condensate, 11: 8646, 8649
thermal stresses in Hanford waste, electrical analogue for studying, 11: 6698

Tanner Wash Quadrangle (Ariz.)
photogeologic map, 11: 1110(J)

Tannins
radiosensitivity effects, 11: 889(J)
removal of α activity in effluent water by, 11: 10033

Tantalates
dielectric permeability of divalent metal, 11: 264(J), 10076(J)
ferroelectric properties, theory, applications, 11: 6750(J)

Tantaloy
See Tantalum carbides.

Tantalum
alpha-particle scattering at 40.2 Mev, 11: 6952(J)
analytical chemistry, bibliography on, 11: 7109
annealing, degassing, and hardness, effects of dissolved gases, 11: 13338
anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)
boiling point and heat of vaporization of $TaCl_5$, 11: 6243(J)
chemical determination in presence of Nb by precipitation with N-benzoyl-N-phenylhydroxylamine, 11: 7951(J)
colorimetric determination, 11: 13274(J)
colorimetric determination in ore, after separation from Nb and Ti, 11: 1833(J)
corrosion, 11: 7857(R), 12585(R), 13682(R)
corrosion by aqua regia, 11: 12321(R), 12965(R)
corrosion by Cr–U eutectic, 11: 7673(R), 8512(R), 11704(R)
corrosion by liquid metals, 11: 13113(R)
corrosion by liquid Th–Mg alloys, 11: 11703(R)
corrosion by liquid U and Cr–U alloys, 11: 7676(R)
corrosion by machine wash solutions, 11: 13027(R)
corrosion by HNO_3–Pu solutions, 11: 3814
corrosion by H_2SO_4, 11: 3809(R)
corrosion by Thorex solutions, 11: 7487
corrosion by U, 11: 7408(R)
corrosion resistance properties, 11: 13326(J)
cross sections, 11: 13197(R)

Tantalum (cont'd)
determination in mixture of Nb_2O_5 and Ta_2O_5 using radioactive tracer, 11: 5778
deuteron, He^3, and α scattering cross sections, 11: 10996(R)
deuteron and proton reactions, neutron yields from, 11: 4709(J)
electron emission at elevated temperatures, surface reactions of, 11: 1919(J)
electron scattering from nonspherical nuclei, 11: 10262(J)
emissivity and reflectivity, measurement of total normal, 11: 6421
gamma reactions (γ,n), 11: 704(J)
gamma reactions (γ,n), cross sections, 11: 12914(J)
gravimetric determination in mixtures of Mo, Ni, Ti, W, and Zr, 11: 3703
gravimetric determination in Ta–U alloys, 11: 925
interaction of 14-Mev neutrons with, neutron emission probabilities from, 11: 12913(J)
ion emission from positive Cs ion bombardment, 11: 1945(J)
ion exchange separation from Pa and Nb, 11: 8282(R)
neutron resonance widths, 11: 7292(R)
neutron scattering, 11: 607(J), 2026(R), 2623, 3035(J), 3046(J), 3593(J), 4047(J)
neutron spectra, 11: 10229
neutron yields from He^3 reactions, 11: 8726
nuclear reactions with C^{12}, C^{13}, and N^{14} ion bombardment, 11: 9076(J)
oxidation at high temperatures and pressures, 11: 304
photoneutron yields, 11: 4130(J)
radioactive wire, calibration for use as gamma source for radiotherapy, 11: 4940(J)
reduction of Ta^{5+} in oxalic acid, 11: 8265(R)
refining, coating, corrosion, and alloys, 11: 348(J)
self-diffusion in, measurement, 11: 11228(J)
separation from niobium, 11: 7386(P)
separation from Nb, a literature survey, 11: 1811
separation from Nb by cupferron precipitation, 11: 11942(J)
separation from Nb by 8-quinolinol, 11: 13294(J)
separation from Nb by solvent extraction, 11: 181, 3229(P), 4454(R), 5259, 7673(R), 7676(R), 11501(P), 11703(R), 11704(R)
separation from ore concentrate by caustic fusion, 11: 10471
separation from H_2SO_4–HCl media by solvent extraction, 11: 13274(J)
solubility in HF–H_2O_2, 11: 1917(J)
solvent extraction, 11: 13197(R)
solvent partition, distribution ratios, 11: 12186(R)
sorption on Dowex-1 and elution with HCl–HF solutions, 11: 12339(R)
spectra, Nevis cyclotron analysis, 11: 10244
spectrophotometric analysis for W using dithiol, 11: 7950(J)
thermal neutron total cross sections, 11: 7826(R)
thermal properties at high temperatures, 11: 1527(R), 2937(R)
thermal properties of, bibliography, 11: 331
vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)
x-ray-fluorescence determination in Ta oxide, 11: 4824

Tantalum alloys
corrosion by distilled water at 200 and 300°C, 11: 10078

Tantalum borides

heat of formation, 11: 8909(J)

Tantalum carbides

chemical, physical, and mechanical properties, 11: 920(J), 5856

preparation of molten, 11: 267(J), 11231(J)

thermodynamic properties, abrading properties, and electrical resistance, 11: 5767(J)

Tantalum–carbon systems
See Carbon–tantalum systems.

Tantalum chloride–niobium chloride systems
See Niobium chloride–tantalum chloride systems.

Tantalum complexes

with chloride, anion exchange, 11: 2254(R)

Tantalum crucibles

carbon coated, corrosion by liquid U–Cr alloys, 11: 7677(R)

Tantalum hydrides

lattice constants and phase studies, 11: 5333

Tantalum–hydrogen systems
See Hydrogen–tantalum systems.

Tantalum isotopes

decay schemes of Ta^{176}, Ta^{177}, and Ta^{178}, 11: 10246

neutron energy levels, 11: 10232(R)

relative abundance, 11: 2491

Tantalum isotopes Ta^{180}

decay, 11: 5374(J)

determination in MTR crystal spectrometer, 11: 2624

Tantalum isotopes Ta^{181}

angular correlations, 11: 550(R)

Coulomb excitation, 11: 573(J), 4067(J), 6051(J)

energy levels, 11: 3529(J), 10686(R)

energy levels, gyromagnetic ratio of 10^{-8}-sec, 11: 11374(J)

gamma rays in, polarization, 11: 4996(J)

gamma reactions (γ,n), direct excitation above the giant resonance, 11: 9142(J)

quadrupole moments, 11: 4646(J)

neutron total cross sections and resonance parameters, 11: 9078(J)

Tantalum isotopes Ta^{182}

beta spectrum, 11: 10252(J)

decay scheme investigation by coincidence scintillation spectrometer, 11: 13445(J)

use of wire implants of, in therapy of bladder carcinoma, 11: 62(J)

Tantalum ores

acid leaching, 11: 11701(R)

caustic fusion for Ta separation, 11: 10471

processing, 11: 7673(R)

processing with basic fusion, 11: 8512(R), 11704(R)

Tantalum oxide–sodium oxide systems
See Sodium oxide–tantalum oxide systems.

Tantalum oxides

gaseous species in equilibrium at high temperatures, 11: 10231(R)

lattice dimensions and density of Nb_2O_5, 11: 8543(R)

x-ray-fluorescence analysis for Ta, 11: 4824

Tantalum–tin–zirconium alloys

corrosion by 600 to 680°F water, 11: 13068(R)

Tantalum–tungsten–uranium alloys

colorimetric analysis for W using hydroquinone, 11: 8847(J)

Tantalum–uranium alloys

corrosion, 11: 7663(R)

creep strength at 1500 to 1800°F, 11: 12630

gravimetric analysis for Ta, 11: 925

phase studies, 11: 8487(R), 8495(R)

Tantalum–uranium–zirconium alloys

corrosion by water, 11: 8926

Tantalum–vanadium alloys

phase studies, 11: 4454(R), 7677(R)

phase studies and hardness, 11: 7673(R)

Tantalum–zirconium alloys

constitution diagrams, 11: 7677(R)

creep and rupture behavior, 11: 1524

phase studies, 11: 7676(R), 8512(R)

phase studies, thermal analysis, electrical resistance, and hardness, 11: 12064(J)

Tape recorders
See Magnetic recording systems.

Targets
See Materials Testing Accelerator targets; Radiation targets.

Tartaric acid

analytical use with thoron in spectrophotometric determination of Th, 11: 7953(J)

Taurine

chemical determination in urine, 11: 13229(R)

TBP
See Butyl phosphates.

TBP Process

analytical control, design of a continuous γ monitor for U analysis, 11: 11737

analytical control, refractive indices of process streams, 11: 2340

chemical stability of iron sulfamate in process solutions, 11: 7525

chemicals used in, physical properties, 11: 8365

corrosion of austenitic stainless steels in process streams, 11: 7615

corrosion of stainless steel pipes in process streams, 11: 8455

density and viscosity of process solutions, 11: 2339

development and flowsheets, 11: 3367(J), 8323

development studies, 11: 9655

effect of single-cycle batch counter current on U recovery, 11: 7552

extraction apparatus for, evaluation, 11: 2341

feed preparation, 11: 7528

feed preparation from stored waste, 11: 7524

monitoring of pH in neutralized wastes in, 11: 8377

nitric acid recovery, 11: 8369

pilot plant design, 11: 9657

plutonium yield control, by Fe^{2+} addition and pH adjustment, 11: 7485(R)

process efficiency, 11: 8343(R)

raffinate processing, 11: 8336

settling rates and properties of sludge-supernate slurries, 11: 13590

slurry handling, 11: 7527

solvent extraction of Pu in, 11: 11600

TBP Process (cont'd)
solvent extraction of U from metal wastes, 11: 12399
solvent extraction separation of U and Pu from fission products, 11: 13517(J)
solvent processing, 11: 13667
solvent properties of TBP, nitric acid recovery, and decontamination, 11: 8368(R)
solvents, 11: 8371, 12970(R)
spectrophotometric analysis for Ca, 11: 11584
uranium extraction column performance in, effects of temperature on, 11: 8375
waste concentration, factors affecting, 11: 7529
waste disposal flowsheets, 11: 13665
processing, 11: 12440
waste slurries, viscosity and settling rates, 11: 7592
waste storage, solubility relationships, 11: 7524

Teapot Operation
biological effects of glass fragments as penetrating missiles following atomic explosions, 11: 2773
blast effects from atomic explosion on machine tools determined during, 11: 1856
blast effects from atomic explosion on mobile homes and emergency vehicles, 11: 11830
civilian defense training program, 11: 1750, 1751
development of photographic techniques for biological blast effects, 11: 1924
documentary photographic procedures for, 11: 7040
effects of noise on mice in blast-resistant shelters, 11: 9908
effects of nuclear explosion on canned food, 11: 7070
effect of nuclear explosion on petroleum gas installations and facilities, 11: 9905
fall-out monitoring, 11: 10178
radioactivity induced in food exposed during, 11: 1752
radiological telemetering systems tested for fall-out monitoring during, 11: 11039
study on distribution and density of low-velocity missiles from nuclear explosions, 11: 2774
thermal radiation measurements during, 11: 7243

Teapot Reactor
See Boiling reactors.

Technetium
absorption spectra of Tc^{7+}, 11: 13577(R)
preparation, flow sheets for, 11: 11574(R)
properties of fission product, 11: 4929(J)
recovery from 25 Process first column waste, 11: 8347
spectrophotometric determination in $HClO_4$ solutions, 11: 8296(R)

Technetium chlorides
synthesis of $TcCl_4$ and related compounds, 11: 10045(J)

Technetium isotopes
formation by proton irradiation of Mo, 11: 8286(R)
measurement of 18- and 4.5 min., 11: 7319(J)
radioactivity and gamma spectra, 11: 12970(R)

Technetium isotopes Tc^{96}
positron decay, energy available for, 11: 6155(J)

Technetium isotopes Tc^{99}
fluorescence yield of K shell, 11: 3030(J)
half lives, 11: 13633(R)

Technetium isotopes Tc^{100}
gamma and beta spectra, 11: 8286(R)

Technetium isotopes Tc^{101}
decay properties, 11: 11576(R)
decay schemes, 11: 550(R), 2026

Technetium isotopes Tc^{103}
identification, 11: 7319(J)

Technetium isotopes Tc^{104}
formation with half life of 3.8 ± 2 min, 11: 623(J)

Technetium oxides
volatilization, 11: 13577(R)

Technical Information Service Extension, AEC
report number series used in cataloging reports, 11: 12634

Technical Operations, Inc., Arlington, Mass.
progress reports on application of isotopes for aircraft radiography, 11: 10521(R)

Technical reports
cataloging, report number series used by the Technical Information Service, AEC, 11: 12634

Teflon
See Ethylene, tetrafluoro- polymers.

Tektites
radioactivity, cosmic ray induced, 11: 12037
water content, 11: 8001(J)
water in, survey of studies, 11: 5374(J)

Television equipment
closed circuit for Calder Hall, 11: 12117(J)
performance as remote viewer for rear face of Hanford piles, 11: 11732
performance for scanning nuclear test aircraft engines, 11: 11328
radiation effects, 11: 2561

Tellurium
adsorption by LaF_3 or MnO_2, 11: 7520
chromatographic separation of carrier-free, 11: 4371
electron energy losses in, and its compounds, 11: 745(J)
fluorination at 0 to 100°C, 11: 150(J)
gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856
ion-exchange behavior on Dowex-1, 11: 1542(R)
neutron total cross sections, 11: 1276(R)
radioactivity and weight of fission products, formed in reactor fuel, 11: 5670
separation from Ru, Cs, and rare earths using anion exchange, 11: 9263(J)
separation from U, 11: 13577(R)
separation of I^{131} from, after neutron irradiation, 11: 4552

Tellurium–bismuth systems (liquid)
See Bismuth–tellurium systems (liquid).

Tellurium compounds
crystallography of Cs_2TeI_6, 11: 1787(J)
oxidation of tellurous acid by γ rays, 11: 1806(J)

Tellurium fluorides
chemical properties, Lewis acid character, 11: 8831(J)
formation in fluoride volatility processes, 11: 7408(R)
preparation and properties, 11: 150(J)
radiochemistry, 11: 7408(R)

Tellurium ions

isotopic exchange between Te^{4+} and Te^{6+} in acid solution, 11: 7105(J)

Tellurium isotopes

half lives and decay schemes, 11: 12855

neutron inelastic scattering, 11: 3592

Tellurium isotopes Te^{122}

energy levels, mixing ratios of 2+ → 2+ transitions, 11: 12203(J)

Tellurium isotopes Te^{124}

energy levels, mixing ratios of 2+ → 2+ transitions, 11: 12203(J)

Tellurium isotopes Te^{125}

decay schemes and excited states from decay of I^{125}, 11: 775(J)

Tellurium isotopes Te^{129}

radiometric determination in human subjects by external counting, 11: 7291(R)

Tellurium isotopes Te^{131}

isomers, 11: 12970(R)

Tellurium isotopes Te^{132}

iodine emanation, 11: 2838(J)

Tellurium–silver systems
See Silver–tellurium systems.

Temperature

(See also Pyrometry.)

distribution in spherical pellets, 11: 9758

effects of cold on induction of mutants in yeast, 11: 862(J)

environmental, effects on metabolism, life span, and histological features of soft tissues in rats, 11: 10394

high, at high pressures, problem of obtaining, 11: 7213(J)

measurement with thermal-sensitive indicators, 11: 4493

Temperature control

design of system for remote, 11: 7033(P), 11539(P)

modulator for thermocouples in, 11: 1566

self-heating resistance thermometer design for, 11: 4544(R)

for thermal testing fuel elements, 11: 1962

Temperatures
See Transformation temperatures.

Tennessee

uranium distribution in Chattanooga shale in DeKalb, Cannon, Warren, Coffee, Moore, Jackson, and Putnam Cos., 11: 3406

Tennessee Eastman Corp., Oak Ridge, Tenn.

progress reports, 11: 13027(R)

Tennessee. Univ., Knoxville

progress reports on agricultural research, 11: 5134(R), 11021(R)

Tensile properties

statistical analysis of effects of temperature and metal groups on, 11: 12048

Terbium

absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969

activation state in phosphors, 11: 12145(J)

ion exchange using ENTA, 11: 6302(J)

melting point, 11: 4810(R)

metallic phase transitions, 11: 8117(R)

physical and chemical properties, 11: 5816(J)

proton scattering cross sections, 11: 1542(R)

Terbium isotopes

formation by double neutron capture, 11: 7091(R)

nuclear properties of neutron-deficient, 11: 7091(R)

Terbium isotopes Tb^{158}

isomeric transitions, 11: 9518(J), 10363(J)

Terbium isotopes Tb^{160}

decay, 11: 10785(J)

decay schemes, 11: 1278(R), 2027(R)

gamma emission, 11: 9054(R)

Terbium isotopes Tb^{161}

beta decay, 11: 2084(J)

Terphenyl

burnout studies, 11: 12891(R)

moderator properties, 11: 8686(R)

physical properties, 11: 12239(R)

radiation damage and thermal decomposition, 11: 12331(R)

radiation effects, 11: 7847(R)

scintillation decay times, measurement, 11: 517(J)

Terphenyl–biphenyl systems
See Biphenyl–terphenyl systems.

Terphenyls

compressed-pellet infrared analysis for isomers, 11: 5794(J)

decomposition of irradiated, 11: 13968(R)

heat and radiation stability, 11: 3745(J)

Testes
See Gonads.

Testing methods
See Materials testing.

Tetraethylene glycol, dibutoxy-

solvent extraction of Th^{230} using, 11: 7465

solvent extraction of U with, suitability for

solvent properties for U in ore solutions, 11: 11570

solvent properties for U in the pentaether process, 11: 13023

Tetrahymena
See Protozoa.

Tetraphenylarsonium compounds
See Arsonium compounds.

Tetrazolium compounds

chemical properties, 11: 1187(J)

Texas

uranium deposits, collected field material on, 11: 6356(R)

Texas (Upton Co.)

uranium occurrence in, 11: 1087(J)

Textiles

(See also Clothing.)

electrostatically charged, efficiency in the removal of particulate matter from air, 11: 6322

ignition and thermal radiation damage, 11: 7359

pyrophoricity, 11: 9949

thermal shielding properties, 11: 9949, 10397

Thallium

absorption and luminescence of fluoride solutions in, 11: 148(J)

activation determination, 11: 7455(R)

Thallium (cont'd)
anomalous internal conversion ratios of E3 transitions, 11: 9447(J)
melting temperature at pressures up to 30,000 kg/cm², 11: 1533, 3856(J)
neutron total cross sections and resonances in kev region, 11: 4047(J)
photoneutron yields, 11: 4130(J)
polarographic determination in Pu-bearing solutions, 11: 12346
radiometric titration, 11: 13277(J)
recovery, equipment for, 11: 6654
recovery from plating baths by ion exchange, 11: 6654
solvent extraction in HCl–bis 2-chloroethyl system, 11: 9186(R)
thermal-neutron coherent scattering amplitudes, 11: 4050(J)
Thallium chlorides
heat of formation, 11: 1419(J)
solvent extraction into ether, of complexes, 11: 7937(J)
Thallium complexes
formation of $HTlCl_4$ and ether extraction, 11: 4843
with nitrate ions, spectrophotometric study, 11: 4313(J)
solvent extraction into ether, of chlorides, 11: 7937(J)
Thallium iodide–potassium iodide systems
See Potassium iodide–thallium iodide systems.
Thallium iodides
spectra, 11: 7455(R)
Thallium ions
effect on photoreduction of Ce^{4+} in H_2SO_4, 11: 10462(J)
reactions with Ce^{4+}, effects of γ irradiation on, 11: 11576(R)
Thallium isotopes Tl^{195}
isomeric transitions and half lives, 11: 9513(J)
production and decay properties, 11: 5949(J)
Thallium isotopes Tl^{196}
production and decay properties, 11: 5949(J)
Thallium isotopes Tl^{197}
isomeric transitions and half lives, 11: 9513(J)
production and decay properties, 11: 5949(J)
spin, 11: 10707(J)
Thallium isotopes Tl^{198}
decay scheme, 11: 783(J)
decay schemes of Tl^{198m}, 11: 9514(J)
spin, 11: 10707(J)
Thallium isotopes Tl^{199}
spin, 11: 10707(J)
Thallium isotopes Tl^{200}
decay properties, 11: 491(J), 6516
electric quadrupole transition at 148 kev, 11: 9445(J)
radiation from, 11: 10358(J)
Thallium isotopes Tl^{202}
energy levels populated from 3.62-h Pb^{202m}, 11: 9515(J)
half lives of isomeric states, 11: 9509(J)
radiation from, 11: 10358(J)
Thallium isotopes Tl^{203}
l-forbiddenness, influence on magnetic dipole transitions, 11: 8145(J)
Thallium isotopes Tl^{204}
backscattering correction procedure test on, 11: 1690(J)
decay, ratio of L/K x-ray intensities in, 11: 13458(J)
Thallium isotopes Tl^{204} (cont'd)
distribution in the rat, 11: 10425(J)
half life, 11: 1567(J), 3526(J)
incorporation in activated clay β-sources, 11: 7051(J)
spin and hyperfine structure splitting, 11: 10707(J)
Thallium isotopes Tl^{206}
beta decay spectra, 11: 8239(J)
Thallium isotopes Tl^{208}
alpha-gamma angular correlation, 11: 8118(J)
Auger electron spectrum, 11: 1949(J)
decay, low intensity transitions in, 11: 6968(J)
diffusion in air of ions, 11: 12073(J)
energy level at 40 kev, lifetime, 11: 6053(J)
energy level transitions, $\alpha-\gamma$ angular correlation, 11: 8118(J)
gamma ray at 40 kev, detection by scintillation counters in triple coincidence, 11: 3542(J)
half life, 11: 12197(J)
range-energy relation for α-recoil atoms, 11: 12198(J)
Thallium isotopes Tl^{209}
decay schemes, 11: 7455(R)
Thallium isotopes Tl^{210}
decay, low intensity transitions in, 11: 6968(J)
decay schemes, 11: 786(J)
Thallium–mercury alloys (liquid)
See Mercury–thallium alloys (liquid)
Thallium–silver alloys
See Silver–thallium alloys.
Thallium sulfates
crystal structure, 11: 10453(J)
Therapy
See Antibiotic therapy; Chemotherapy; Radiotherapy.
Thermal analysis
See Differential thermal analysis.
Thermal capacity
empirical methods for estimating, 11: 10115(J)
Thermal columns
See Reactor thermal columns.
Thermal conductivity
(See also Heat transfer.)
heat transfer review, 11: 5300(J)
measurement, 11: 5891
measurement, apparatus for, 11: 2937(R), 3875, 7846(R), 13868(R)
measurement, equations for, 11: 1853(J), 2552
measurements in liquids, design of hot plate for determination, 11: 1855(J)
measurements in solids, bibliography on methods, 11: 1031
radiation effects, 11: 8747(R)
of solid-liquid mixture, 11: 11745(R)
temperature dependence, mathematical analysis, 11: 3787
testing equipment, 11: 8542
Thermal conductometric analysis
of gas mixtures, apparatus, 11: 10000(J)
Thermal convection
See Convection.

Thermal cycling
literature survey, 11: 2935
of uranium, ratchet theory of dimensional instability due to, 11: 8513
Thermal cycling apparatus
improvements, 11: 13763(R)
Thermal diffusion
mathematical analysis of cascade columns, 11: 8555
of rare gases through a rubber membrane, 11: 8970(J)
for separation of metals in aqueous solution, 11: 7139(R)
theory, evaluation for U separation, 11: 7701
Thermal diffusivity
See Thermal conductivity.
Thermal fusion
See Thermonuclear reactions.
Thermal fusion bombs
See Thermonuclear weapons.
Thermal injuries
(See Burns.)
Thermal insulation
(See also Ceramic materials; Thermal radiation shielding.)
corrosion by liquid Na, 11: 7847(R)
heat transfer properties of, survey of data, 11: 386
materials, 11: 3384(J)
for underwater uses, 11: 13006
Thermal neutron cross sections
compilation, 11: 4631
spherical symmetry method for measuring, theory, 11: 3507(J)
Thermal neutrons
attenuation in air filled cylindrical ducts in a water shield, 11: 9046
biological effects on mice, 11: 868(J)
capture by Ca, Ni, and K nuclei, γ rays from, 11: 710(J)
capture by Ti, Fe, and Si nuclei, γ rays from, 11: 711(J)
capture of, γ rays from, 11: 591(J)
cytogenetic effects on dormant tomato seed, 11: 13237(J)
detection and measurement, design of instrument for, 11: 5438
detection and measurement of, using diborane-filled counting tubes, 11: 10186(J)
detection and measurement with BF_3-filled spark counter, 11: 9005(J)
detection with boron loaded nuclear emulsions, 11: 6815
detection with Zn S(Ag) in B_2O_3 scintillators, 11: 2613
diffusion coefficients, numerical integration technique for computing, 11: 1363
diffusion equation in boundary of slowing down media, 11: 8115(J)
diffusion in D_2O, 11: 2719
diffusion length in concrete, 11: 789
flux distribution measurements in heavy water, 11: 10334
mean free transport path, 11: 7288(J)
mean transfer free paths in solids, 11: 682(J)
relaxation length of, in graphite thermal columns, 11: 12508(R)
relaxation times in subcritical assemblies, 11: 4016(R)
resonances, angular momentum associated with, 11: 1617(J)
spatial distribution in $Zr-H_2O$ mixtures, 11: 2619
spatial distribution of, from a N^{17} source in water, 11: 6859(J)
transmission in straight annular ducts through BEPO shielding, 11: 8176
velocity distribution from diffusing media, time-of-flight method, 11: 9434(J)
Thermal noise
See Noise.
Thermal nuclear reactions
See Thermonuclear reactions.
Thermal properties
bibliography on, 11: 6362
bibliography on, of Cr, Cu, graphite, Mo, and Ta, 11: 331
transient and stationary measurements, 11: 1043(J)
Thermal radiation
(See also Infrared radiation; Actinic radiations; Heat transfer.)
from atomic explosions, hazards to military installations, 11: 1403
from atomic explosion, measurement, 11: 7243
burns produced on pig skin by, effectiveness of protective ointments, 11: 9948
burns produced on pig skin by, effectiveness of textiles as shielding, 11: 9949
burn production on pig skin exposed to, factors affecting, 11: 6598
effects on structural materials, 11: 325
heat transfer review, 11: 5300(J)
ignition and damage to cellulosic materials following exposure, 11: 7359
pathological effects, 11: 3652, 10397
pathological effects on porcine skin, exposure scale, 11: 5137
response of Al alloys to, 11: 326
skin burns produced by, on skin treated with protective ointment, 11: 835
transformation into electricity, scheme and efficiency, 11: 3444(J)
Thermal radiation shielding
corrosion by liquid Na, 11: 7847(R)
materials for, 11: 14024
for vacuum furnaces, 11: 1903(J)
Thermal reactors
(See also specific reactors, e.g., Brookhaven Reactor.)
antineutrino flux distribution from, 11: 4968(J)
breeding, 11: 7842(R)
control requirements, calculation of, 11: 13493, 13494
control rods, effectiveness of disconnected, in relation to diameter, number, and arrangement, 11: 6904
control systems, 11: 1329, 4943(J)
coolant for, properties of liquid Mg as, 11: 8672
critical mass determinations by graphical methods, 11: 9832
design for aircraft propulsion, 11: 5121(P)
design for electric power production, 11: 13891
design of breeder, principles of fuel and blanket processing, 11: 188(J)
design of homogeneous, 11: 6082
development, 11: 11746(R)
disconnecting rods, effectiveness in regard to diameter, number, and arrangement, 11: 9487(J)
fuel consumption rate and Pu production in, calculations, 11: 9481(J)
fuel cycles, 11: 6083, 6096(J)
fuel recycling in equilibrium Th single region, 11: 9466
heat transfer, thermal stress and neutron diffusion physics, 11: 12553
irradiation units for, intra-conversion, 11: 9845
mathematical analysis of fuel burnup and poison effects, 11: 9135(J)
moderators, coolants, and fuel cycles for power, lecture on, 11: 2128(J)
neutron flux changes under long-term irradiation, 11: 11413
neutron flux distribution, mathematical analysis, 11: 1654(J)

Thermal reactors (cont'd)
neutron flux measurements, 11: 6900
neutron source effect on Belgian, 11: 10302
non-aqueous fluid fuel converter, nuclear data and design methods, 11: 11800
poisoning in, due to stable fission products, 11: 1324
reactivity, 11: 682(J), 1329, 2114, 4090, 13965
reactivity and poisoning of, as a function of irradiation time, 11: 13865
reactivity effects of very inhomogeneous enriched loadings, 11: 10953
resonance escape probability in, 11: 12232
shutdown, theoretical calculations, 11: 14011
small source model, 11: 9831

Thermal siphons
See Siphons.

Thermal rupture
literature survey, 11: 2935

Thermal stresses
in cylinders, calculation of, 11: 3072
in cylinders with internal heat generation, calculation, 11: 10641
in disks, due to non uniform peripheral heating, 11: 2544
evaluation by strain measurements, 11: 5846
mathematical analysis, 11: 7867, 10798, 11162
in spherical shells from linear heating of inside wall, analysis, 11: 8560
stress and axial variation in temperature in the attachment of a tube to a header, mathematical analysis, 11: 2416
in thin plates, methods of calculating, 11: 10517

Thermal Test Reactor
See Hanford Thermal Test Reactor; KAPL Thermal Test Reactor.

Thermal transformation
See Constitution diagrams.

Thermistors
See Resistors.

Thermobalances
See Balances.

Thermocouples
(See also Thermometers.)
calibration, compensating circuit for, 11: 3914(J)
calibration changes due to neutron irradiation, 11: 2756
calibration in-pile, 11: 10959
for control rods of Experimental Breeder Reactor, 11: 13763(R)
corrosion, 11: 13985(R)
design for temperature measurement of Al alloys, 11: 6376
design of constantan-gold, 11: 14030
design of, for measuring EBWR vessel temperatures, 11: 11747(R)
design of B coated, for measurement of neutron flux, 11: 3948
evaluation as unconventional source of electricity, 11: 9345
fabrication and calibration of base metal, techniques, 11: 10553
modulator and circuit, 11: 1566
output and time constant of B coated, for measurement of neutron flux, 11: 3949
Peltier cooling effect, investigation, 11: 1175
radiation effects, 11: 13724
recovery corrections for butt-welded, straight-wire, in high-velocity, high-temperature gas streams, 11: 2963
speed of response, 11: 13864(R)
stability of chromel–alumel in CO_2 at 1000°C, 11: 4541
survey of data, 11: 386

Thermodynamic properties
free energy functions for 54 gaseous elements, 11: 12106(J)
tabulation for 54 elements considered as ideal monatomic gases, 11: 5368

Thermodynamics
(See also Physical chemistry; Physics.)
applications in rheology, 11: 7165
equation of state developments, review, 11: 4272(J)
theory of irreversible processes and sedimentation equilibrium of fluids, 11: 1186(J)

Thermoluminescence
in alkali halide crystals, 11: 6756(J)
in aluminum oxide, 11: 7218(J)
in calcium fluoride (Mn activated), effect of Mn content on, 11: 8030(J)
in inorganic crystals and glasses, 11: 7219(J)
in lead sulfates, sodium sulfates and miscellaneous sulfates, oxides, and carbonates, 11: 7220(J)

Thermometers
(See also Resistance thermometers; Thermocouples.)
circuit design for remote, 11: 1923(R)
design for gases, using change of pitch of sound, 11: 9558(P)
nuclear resonance precision, 11: 4922(J)

Thermometry
design of system for remote, 11: 11539(P)
in gases, device using change of pitch of sound, 11: 9558(P)
in reactors, methods, 11: 10149

Thermonuclear explosions
(See also Detonation waves; Shock waves.)
civilian protection, specifications for shelter systems, 11: 4218
fall-out monitoring by γ counting, 11: 10650
meteorological aspects, review, 11: 7905(J)
radiation hazards, 11: 832, 834, 6470

Thermonuclear reactions
(See also Electric arcs; Sherwood project.)
bibliography of unclassified literature, 11: 5393
catalysis by μ^- mesons, 11: 10213(J), 13442(J)
development using pinch effect, review, 11: 7234(J)
discussion of Russian research, 11: 390(J)
electron effects on, theory, 11: 6176(J)
feasibility, 11: 11834(J)
light nuclei formation in expanding universe, 11: 7340(J)
pinched gas, cooled by bremsstrahlung radiation, equilibrium characteristics, 11: 4519(J)
power from fusion, 11: 7044(J), 12101(J)
production in gaseous discharge, 11: 429(J), 1941(J)
rates between two gases in thermal equilibrium, 11: 4517(J)
in relation to astrophysics and cosmology, 11: 11273
research programs, 11: 10390(J)
search for controlled, review, 11: 6107(J)
in stars, buildup from helium, 11: 11275(J)

Thermonuclear reactors
bibliographies, 11: 12900
control, black-box approach, 11: 8946(J)
heat transfer analysis of, in rockets, 11: 8895(J)
physical problems of controlled, 11: 2775(J)
power balance in, operating under various idealized conditions, 11: 4518(J)

Thermonuclear reactors (cont'd)
for power production, 11: 12102(J)
stability of pinched plasma with imposed longitudinal magnetic field, 11: 12506
theory, 11: 6790(J)
Thermonuclear weapons
hazards and protection, 11: 9205(J)
seismological and related aspects of the 1954 explosions, 11: 7042(J)
Thermostats
(See also Temperature control.)
micro-, for x-ray studies on single crystals, 11: 467(J)
Thicketty Creek Area (S. C.)
exploration, geology, mineralogy, and monazite reserves, 11: 4864
Thickness gages
design of eddy current, for MTR fuel plate cladding, 11: 4538
design using α-particles, for foils and films, 11: 4924(J)
development, 11: 210(J)
industrial applications of beta gages in France, 11: 10619(J)
krypton-85 source for industrial, 11: 5375(J)
use of Co, Cs, and Na radioactive isotopes for, 11: 5708(P)
Thiocyanate complexes
stability with mercury, 11: 9587(R)
Thiols
analytical use of dithiol in determining W in Ta, Ti and Zr, 11: 7950(J)
interaction between disulfides and, 11: 5771(J)
radiation chemistry, 11: 960(J)
Thionine
radiation effects, preparation of stable free radicals, 11: 7132(J)
Thiourea
See Urea, thio-.
Thomas Cyclotron
See Cyclotrons.
Thorex Process
(A solvent extraction process for the decontamination and separate recovery of U^{233} and unreacted Th from irradiated thorium.)
aluminum nitrate for, production processes and cost estimates, 11: 7497
analytical control manual, 11: 3697
analytical methods for solutions, 11: 11586(R)
analytical schedule for, 11: 7496
beta and gamma activities due to Th and U^{233} backgrounds, 11: 7499
centrifugation in MnO_2, 11: 13672
chemical flowsheets for U^{233} and Pa^{233} recovery and decontamination, 11: 7539(R)
concentration and decontamination of U stream in ion exchangers, evaluation of, 11: 11628
corrosion studies, 11: 7487
cost factors for processing homogeneous reactor fuels, 11: 13641
criticality study of pilot plant, 11: 12703
decontamination, pilot plant run, 11: 11617
decontamination of processing vessels by steam jets, 11: 3750
decontamination of the feed adjustment system in pilot plant and radiation exposures received by personnel, 11: 8358
description of process, equipment and operation, 11: 8357(R)
design of TBP extraction process for U^{233}, 11: 8345
development, 11: 8396(R), 11606(R)
Thorex Process (cont'd)
development (laboratory), 11: 8395(R)
dissolution cycle for Al-canned Th, 11: 7409
efficiency and cost of U^{233} recovery from breeder blankets by, 11: 9618
equipment, flowsheets, and metal solution, 11: 13640(R)
extraction equipment for, design, 11: 7490
feed preparation, 11: 9619
feed preparation by HNO_3-dissolution of Th, 11: 12372
flowsheets and decontamination of equipment, 11: 5204(J)
instrumentation for pulse columns, 11: 7488
laboratory development, 11: 13019(R)
personnel radiation exposures during pilot-plant operation, 11: 12314, 13568
pilot plant decontamination, 11: 8353
pilot plant preparation of ThO_2, 11: 12318
pilot plant runs, equipment failures during, 11: 10821
pilot plant test program, 11: 3751, 8348
process efficiency, 11: 8355
processing costs, 11: 9866
resin column performance, 11: 12369
second-cycle decontamination flowsheets, 11: 8350
second-cycle extraction and stripping flowsheets, 11: 7507(R)
second-cycle thorium flowsheets, 11: 7505
second-cycle thorium manpower and cost summary, 11: 12996
slug handling and charging procedures for, 11: 8344
solvent recovery, $Ca(OH)_2$ contactor for, 11: 7486, 12990
solvent recovery and decontamination with $Ca(OH)_2$ slurries, flowsheet, and design and performance of equipment, 11: 8397
uranium and thorium stripping with dilute HNO_3, 11: 13656(R)
uranium product sorption on Dowex resin, 11: 13653(R)
Thoria
See Thorium oxides.
Thorianites
(See also Uranothorianites.)
spontaneous fragmentation on heating due to helium content, 11: 8914(J)
Thorium
activation energy, electric resistance, and water corrosion of annealed and 9-Mev proton-irradiated, 11: 8746
additive for Mg alloys, 11: 10578(J)
alpha-particle scattering at 40.2 Mev, 11: 6952(J)
analysis and separation from ThF_4 sludge by solvent extraction, 11: 12405(R)
analysis for B, rare earths, N, and C in, 11: 12406(R)
analysis for rare earths, 11: 7435
analytical, metallographic, physical testing, fabrication, and machining methods, survey, 11: 8496
annealing of irradiated and cold-worked, 11: 9611(R)
anodizing for electroplating, 11: 8492(R)
apparatus for hydrofluorination and fluorination under glovebox conditions, 11: 3355(J)
arc melted, extrusion, forging, grinding, machining, rolling, and swaging, 11: 12488
arc welding, 11: 13770
atomic and electron heat, 11: 2943(J)
AEC policy on, 11: 4481(J)

Thorium (cont'd)
bibliographies, 11: 10427
bibliography of unclassified report literature on, 11: 1525
body contamination following accidental puncture, case history, 11: 5175(J)
burnup of natural, from U^{233} fission, 11: 7866
casting, furnace for, 11: 13101
casting and properties of cast metal, 11: 11493
casting at 1800°C, 11: 8488
casting in graphite molds, 11: 11703(R)
chemical and spectrographic analyses of, comparison of various methods for, 11: 9596
chemical determination in Mg alloys, 11: 11089
chemical determination in U ore residues, 11: 11493
cladding with Zr, 11: 13837(R)
coating with Al by hot-dipping, 11: 8487(R)
colorimetric determination, 11: 8285(R)
colorimetric determination by thoron method, 11: 10815(R)
colorimetric determination in urine using morin, 11: 1445
complexometric determination with EDTA, 11: 4303(J)
concentration and decontamination using CaC_2O_4 carrier, 11: 13297(J)
continuous dissolving for Thorex Process, 11: 13640(R)
corrosion and scaling, 11: 8492(R)
corrosion by distilled water, 11: 7621, 7666(R), 13733
corrosion of mechanically jacketed, in H_2O, 11: 7602
Coulomb excitation, 11: 573(J)
crystal structure from 1200 to 1450°C, 11: 11703(R)
decay product distribution in Th fluoride and Th oxalate precipitation, 11: 13635
determination by γ spectroscopy, 11: 4312(J)
determination in millimicrogram quantities using nuclear emulsions, 11: 11092(J)
determination in monazite, 11: 5208, 6658(J)
determination in radioactive ore, 11: 2839(J)
determination in stone meteorites, 11: 13352(J)
determination in Thorex Process streams, 11: 3697
determination in U, 11: 9590(R)
determination in U alloys, 11: 13608
determination in U^{233} extraction process solutions, 11: 4280
deuteron reactions, production of U^{230} and U^{232} from, 11: 13201
deuteron reactions (d,n), 11: 9778
dip coating with Pb, Al–Si, and Zn, 11: 8491(R)
dissolution by HF, H_2SO_4, HNO_3 and HCl, 11: 4470(J)
dissolution by HNO_3, 11: 7484(R)
dissolution by HNO_3, effects of fluoride concentration on, 11: 12372
dissolution by HNO_3, kinetics of fluoride-catalyzed reaction, 11: 6639(J)
dissolution by HNO_3–HF and $(NH_4)_2SiF_6$, in stainless steel containers, 11: 8271, 11493
dissolution characteristics of Al-canned, 11: 7409
electric conductivity and thermal diffusivity, 11: 1877(R), 4632(R)
electrical resistivity, 11: 7676(R)
electrolytic precipitation in chloride and fluoride systems, 11: 3365(J)
electron energy levels and nuclear spin, 11: 1289
Thorium (cont'd)
electron energy states, 11: 8942(R)
electroplating of Cu on, for protection against 95°C water corrosion, 11: 13773
electroplating of metals on, 11: 13783
energy band structure calculations, magnetic susceptibility, and zone melting, 11: 7889(R)
energy band structure of metallic phases, 11: 6770
etching by ionic bombardment, 11: 11703(R)
etching with formic acid solutions of HI and HCl, 11: 3428
extrusion, cold working, and hardness, 11: 8518(R)
extrusion of rods, 11: 7646(R)
fabrication, 11: 7664(R), 11696
fabrication and electroplating, 11: 7665(R)
fabrication for reactor breeding blankets, 11: 4701(J)
fires, handling and extinguishing, 11: 3420
fission cross section ratio to U^{235}, 11: 11745(R)
fission product distribution from, 11: 13114(R), 13838(R)
fission product distribution vs. irradiation time, 11: 8357(R)
gasometric analysis for O_2, 11: 13578(R)
grain structure and hardness, 11: 8487(R)
gravimetric determination using rhodanine-N-salicylic acid, 11: 1450(J)
handling, hazards and safety precautions, 11: 13567
hardness and production by electrolysis of $KThF_5$ and $NaThCl_5$, 11: 13096(R)
high-temperature separation, 11: 10829(R)
high-temperature separation from fission products, 11: 6294
high-temperature separation from U and Mg–Th alloys, 11: 4454(R)
impact strength, effect of annealing on, 11: 8507(R)
internal defects, photomicrographic study, 11: 10559
ion exchange separation from U in HNO_3 solutions, 11: 1831(J), 4372
ion exchange separation from UNH, 11: 7517(R)
ionization potential difference and variable valence, 11: 11071(J)
irradiated, spectrographic analysis for U^{233}, 11: 11085
isolation of μg amounts from complex mixtures, 11: 11987(J)
liquid metal extraction, 11: 12490(R)
liquid metal extraction from U, 11: 11978
machining and cropping of ingots and reclamation, 11: 13589
mechanical and physical properties, 11: 8509(R)
mechanical and physical properties, survey, 11: 9740
mechanical and physical properties and melting, 11: 8507(R)
mechanical properties, metallurgy, and corrosion, 11: 12495
melting, powder metallurgy, and properties of electrolytically produced, 11: 8533
melting in BeO and ZrO_2 crucibles, 11: 12493
melting in Ta crucible, 11: 8507(R)
melting point, 11: 8517(R)
metabolism and pathological effects in dogs, 11: 5133(R)
metabolism following intratracheal administration in rats, 11: 3674
metallography of cast, 11: 13599(R)
metallurgical properties, 11: 8491(R)
metallurgical research conference, 11: 8522
metallurgy, 11: 683(J), 5882, 9738, 11711(R)
molten, contamination by BeO and ZrO_2 crucibles, 11: 12493

Thorium (cont'd)

molten salt extraction and separation by iodide decomposition, 11: 8390(R)

natural radioactivity in Thorex Process, 11: 7499

neutron activation, effects of B^{10} additions on, 11: 5878

neutron activation determination, 11: 8285(R)

neutron capture and fission events in thick targets bombarded by 190-Mev deuterons, 11: 14020(R)

neutron capture cross sections, 11: 8139

neutron production by deuterons from NaK-cooled, 11: 13826

neutron reactions (n,γ), 11: 13209

neutron resonance capture by cylinders, 11: 7715, 9150(J)

neutron resonance cross sections, 11: 1616, 2643

neutron total cross sections, 11: 7690(R)

neutron yields from deuteron and proton reactions, 11: 8726

occurrence in accessory allanite of igneous rocks, 11: 9291(J)

pathological effects, metabolism, and bone deposition in dogs, 11: 11019(R)

photoneutron yields, 11: 4130(J)

physical and mechanical properties, 11: 7672(R)

physical properties, 11: 8491(R)

physical properties of cast, 11: 8488

pickling with fused salts, 11: 8491(R)

polarographic determination, 11: 9233(J)

polarographic analysis for U, 11: 10812(R)

polymerization in aqueous solutions, 11: 8286(R)

powder metallurgy, 11: 12492

precipitates with organic acids, thermal decomposition, 11: 6240(J)

precipitation from ammonium oxalate solutions in the Bismuth Phosphate Process, 11: 8362

preferred orientation in extruded rods, 11: 4464(R)

preparation, 11: 8359(R), 11704(R)

preparation, fabrication, phase studies, and alloy properties, 11: 12486

preparation and mechanical and physical properties, 11: 8506(R)

preparation and properties, 11: 10427, 13083(R)

preparation by Ca or Mg reduction of the halides and oxides, 11: 1538(R)

preparation by halide reduction with Ca and $ZnCl_2$, 11: 7006(P)

preparation by Mg reduction of $ThCl_4$, 11: 7676(R)

processing irradiated, by TBP process, 11: 13517(J)

production, bibliographies, 11: 1133

production, casting, and melting, 11: 13589

production, cost estimates, 11: 12361

production, specifications and materials, refractories, at FMPC for, 11: 7669

production and consumable-electrode arc melting, 11: 12333(R)

production by calcium reduction of ThF_4, 11: 7667

production by electrolysis, 11: 8533

production by electrolysis of fused salts, 11: 5205(J)

production by electrolysis of fused salts, mechanical properties and preferred orientation, 11: 7687

production by electrolysis of NaCl–$ThCl_4$, 11: 7686(R), 13097(R)

production by Metallex Process, 11: 7417(R), 7512, 11696

production by metallothermic reduction of ThF_4, 11: 11493

production by reduction of thorium halides with Ca or Mg, 11: 13583

Thorium (cont'd)

production by sodium reduction of $ThCl_4$, 11: 7507(R), 12992

production of, separation of Ra^{228} during, 11: 7674

production (pilot plant), development, 11: 7423

production process review, 11: 11701(R)

properties, preparation of slurries and cost, 11: 4480(J)

properties, production, fabrication, and bibliography, 11: 7632

prospecting, mining, and processing, 11: 7(J), 299(J)

proton fission at 480 Mev, cross sections and distribution curves, 11: 1279(J)

proton inelastic scattering and (p,d) reactions, energy distributions, 11: 9495(J)

proton reactions (p,n), fission, 11: 8722, 10996(R)

purification and decontamination, 11: 7549(R)

purification by electrolysis of fused halides, 11: 7144(R)

purification by ion exchange and solvent extraction, 11: 13634

purification by solvent extraction, 11: 11498(P)

purification from rare earth traces using hexamethylenetetramine, 11: 10812(R)

pyrophoricity, 11: 2934(J)

radiation damage by protons and deuterons, fission-fragment annealing of, 11: 7693(R)

radiation dosage determinations and maximum permissible dose calculations, 11: 877

radiation effects, 11: 13982(R)

radiation effects on physical properties, 11: 9611(R)

radioautographic determination in Mg alloys, 11: 5893

radiometric determination following separation from urine, 11: 2242(R), 6209(R)

radiometric determination of internally deposited, 11: 5441(J)

radiometric determination of Ra and regrowth of decay products in decontaminated, 11: 13635

reaction rates with purified H_2 at 400°C and atmos. pressure, 11: 7421

reactions with Ga, 11: 8461

reactor criticality effects of irradiated, 11: 9052(R)

recovery and separation by phytic acid, 11: 3345(J)

recovery from lathe turnings and saw chips, 11: 12492

recovery from monazite, evaluation of Ames process for, 11: 12406(R)

recovery from monazite sands by solvent extraction methods, 11: 8325

recovery from monazite sludge by HNO_3 digestion, 11: 11597

recovery from monazites, 11: 7469, 8326(R), 8328(R), 8329(R), 8330(R), 8510(R), 11598, 12971(R)

recovery from monazites by caustic leaching, 11: 8327(R)

recovery from ores and metal production, 11: 203(J)

recovery from slag and liners of preparation bombs, 11: 8269(R)

recovery from slag materials, 11: 11493

recovery from U ores in Amine Extraction Process, 11: 3362(R)

recrystallization, effect of cold work on, 11: 8300

recrystallization and corrosion, 11: 7663(R)

reduction, melting, rolling, and mechanical properties, 11: 8508(R)

residual stresses in, slugs, 11: 3838

resonance capture of fast neutrons, 11: 8597

resonance neutron capture, 11: 8573

role in nuclear energy, 11: 14(J)

rolling, 11: 9731

Thorium (cont'd)
rolling and forging, 11: 7666(R)
sawing dezinced, operating procedures for, 11: 3421
separation and decontamination in Thorex Process, laboratory development studies, 11: 8395(R)
separation by cation and anion exchange, 11: 4289
separation from Mg–Th alloys by precipitation as ThH_4, 11: 4454(R)
separation from monazites by precipitation, 11: 11625
separation from Pa and U, 11: 11493
separation from Pa and U by TBP extraction from HCl solutions, 11: 4370
separation from Pa by chloride distillation, 11: 9578(R)
separation from Pa by solvent extraction, 11: 9534(P)
separation from rare earths, effect of Na_2CO_2 leaching on, 11: 2327(R)
separation from rare earths by peroxide precipitation, 11: 9589(R)
separation from Th–U–Pa mixtures by cation exchange, 11: 13576(R)
separation from U by anion exchange, 11: 7571(R)
separation from U by complexing with KF and NH_4F, 11: 6315(J)
separation from U by ion exchange, 11: 2327(R)
separation from U by ion exchange in acid solutions, 11: 7468
separation from U with tributyl phosphate, 11: 10038(J)
separation from U^{233}, 11: 3367(J)
separation from U^{233} by solvent extraction and ion exchange, 11: 6694
separation from Zr by paper chromatography, 11: 11988(J)
solubility, 11: 3759
solubility and conductance in ethylenediamine, 11: 11118(J)
solubility in liquid Bi and Bi–Pb, 11: 13884(R)
solubility in Zn, 11: 11241(J)
shotgun analysis procedure, 11: 12406(R)
solvent extraction, 11: 9641, 11647(R), 13633(R)
solvent extraction by Amex process, 11: 10475(R)
solvent extraction by di(2-ethylhexyl) phosphoric acid, 11: 10036(R)
solvent extraction by TBP, 11: 7481(R)
solvent extraction by TBP–HCl and TBP–HNO_3 systems, 11: 1000(J)
solvent extraction by TTA, 11: 13564(R)
solvent extraction from irradiated U, 11: 6997(P)
solvent extraction from monazite leach solutions, 11: 7428(R)
solvent extraction from monazite sulfate solution, 11: 11625
solvent extraction from HNO_3 solutions with TBP, 11: 7571(R)
solvent extraction from Th sludges and mantle-grade $Th(NO_3)_4$, 11: 10813(R)
solvent extraction in Amine Extraction Process, 11: 7090(R)
solvent extraction in Thorex Process, 11: 11606(R), 13019(R)
solvent extraction process for recovery of, from Brazilian concentrates, 11: 12997
solvent extraction with butyl phosphate solutions, 11: 12359
solvent extraction with hexone, 11: 8380(R)
solvent extraction with organo-phosphorus compounds, 11: 9663
solvent extraction with TBP from nitrate solutions, 11: 12339(R)
solvent partition between hexone and HNO_3–$Ca(NO_3)_2$ solutions, 11: 6685(J)
solvent partition in acetylacetone, 11: 11123
solvent partition in aqueous solution and TBP–Solvesso, analysis for rare earths, 11: 12404(R)
solvent partition in Thorex Process solutions, 11: 8357(R)
solvent partition in TBP–kerosene–HNO_3, 11: 10811(R)
solvent properties for C at room temperature and elevated temperatures, 11: 11703(R)
spectra, analysis of complex, 11: 205(J)
spectrographic determination in Ce, 11: 4810(R)
spectrographic determination in Mg, 11: 3705(J)
spectrophotometric determination by color reaction with quercetin and separation from interfering ions, 11: 13273(J)
spectrophotometric determination in mineral separates, use of thoron–meso-tartaric acid, 11: 7953(J)
spectrophotometric determination in silicate rocks and ores, iodate precipitation method for, 11: 6263(J)
spectrophotometric determination in U, 11: 4289, 9590(R)
spectrophotometric determination with dinitrosochromotropic acid, 11: 939(J)
spectrophotometric determination with SPADNS, 11: 4298(J)
strengthening by alloying, heat treatment, and cold work, 11: 13516(J)
study of L electrons with double focalization spectrometer, 11: 10608(J)
tensile properties, 11: 7665(R)
tensile properties and extrusion, 11: 8495(R)
tensile properties and hardness of annealed, 11: 13769
tensile properties of extruded vs. arc-melted, 11: 12456(R)
thermal conductivity, fabrication, and properties of N–Th system, 11: 7662(R)
thermal expansion of rolled, 11: 13598(R)
thermal neutron irradiation of natural, 11: 7866
titrimetric determination by $(NH_4)_2MoO_4$ using diphenyl-carbazone as an indicator, 11: 118(J)
tubes, fabrication and tensile properties, 11: 13774
vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)
vapor deposition of Nb, Mo, and Zr on, 11: 11702(R)
volatilization and liquid metal and molten salt extractions from irradiated U and Th–U alloys, 11: 7546(R)
volatilization of fission products from irradiated, 11: 12487
volumetric determination in Ce–Th alloys, 11: 3694
volumetric determination in HNO_3 solution with EDTA, 11: 923
volumetric determination in presence of U, Al, and Hg, 11: 2826
volumetric determination using azoxine indicator, 11: 6261(J)
volumetric determination with dinitrosochromotropic acid, 11: 938(J)

Thorium (Al clad)
dissolution in HNO_3, 11: 8357(R)
dissolution in Thorex process, 11: 13019(R)
extrusion, 11: 7683(R), 8524(R), 11715(R), 12491(R)
fabrication, hardness, and microstructure, 11: 12490(R)

Thorium (clad)
resonance absorption of neutrons in cylinders, 11: 10335(J)

Thorium alcoholates
preparation and properties, 11: 174(J)

Thorium alloys
arc welding, 11: 13770
bibliographies, 11: 10427
corrosion, mechanical and physical properties, and metallurgy, 11: 8506(R)
corrosion, mechanical properties, metallography, physical properties, and preparation, 11: 8509(R)

Thorium alloys (cont'd)

corrosion by boiling water, 11: 7665(R)

corrosion by distilled water, 11: 7621, 7666(R)

electrolytic etching, 11: 8508(R)

hardness and tensile properties, 11: 8507(R)

mechanical properties, metallurgy, and corrosion, 11: 12495

metallurgical research conference, 11: 8522

metallurgy, 11: 683(J)

physical and mechanical properties, 11: 7672(R)

preparation and properties, 11: 10427, 11701(R)

properties, survey, 11: 9740

strengthening, effect of additives, 11: 13769

tensile properties, 11: 7665(R)

Thorium–aluminum alloys
See Aluminum–thorium alloys.

Thorium–antimony alloys
See Antimony–thorium alloys.

Thorium–beryllium alloys
See Beryllium–thorium alloys.

Thorium–bismuth alloy slurries
See Bismuth–thorium alloy slurries.

Thorium–bismuth alloys
See Bismuth–thorium alloys.

Thorium–bismuth–lead alloys
See Bismuth–lead–thorium alloys.

Thorium–bismuth–lead alloys (liquid)
See Bismuth–lead–thorium alloys (liquid).

Thorium Breeder Reactor

breeding blanket design for, 11: 10966

breeding blanket development, 11: 2111, 2653, 2658

cost factors, 11: 13985(R)

cost factors, effects of design, 11: 12586

criticality studies, 11: 13985(R)

design, 11: 6092

design, economic study, process flow diagram, and design of auxiliaries, 11: 9869(R)

design and cost factors, 11: 7859(R), 8618(R)

design and fabrication, status, 11: 13907

design and flow studies of UO_2SO_4–D_2O solutions in circular channels, 11: 2429

design calculations for, core size and concentration, blanket size and concentration, breeding factors, and costs, 11: 8614

fuel and blanket solution processing, 11: 4677

fuel processing costs and processing plant design, 11: 9866

fuel recovery, 11: 188(J)

fuel-recovery cost estimates, 11: 12364

hydroclone design for core processing, 11: 7501

poisoning, 11: 13985(R)

production of isotopes in, effects of flux and process time on, 11: 1373

reactivity of, effect of slurry settling on, 11: 7802

reduced power operation of reactor plant turbine-generator combination, 11: 2673

safety, 11: 11558

temperature of core walls, 11: 7804

thorium oxide slurry blanket, heat-production rate, 11: 2668

xenon poisoning in, effects of radiolytic gas removal on, 11: 7798

Thorium bromides

preparation and chemical properties, 11: 4840(J)

Thorium carbides

chlorination, 11: 11696

Thorium–carbon systems
See Carbon–thorium systems.

Thorium carbonates

canning in Al cans for pile bombardment, 11: 7682(R)

Thorium–cerium alloys
See Cerium–thorium alloys.

Thorium chloride complexes

ion exchange, charge determination in electrolyte by, 11: 8829(J)

preparation of tetramethylammonium-, tetraethylammonium- and Cs-, 11: 11145(J)

Thorium(IV) chloride–sodium chloride systems
See Sodium chloride–thorium(IV) chloride systems.

Thorium chlorides

(See also Cesium thorium chlorides; Potassium thorium chlorides.)

amalgamation with Na amalgam, 11: 11696

chemical and physical properties, 11: 5282

electrochemical properties in anhydrous ethylenediamine, 11: 8835(J)

preparation, 11: 11703(R), 11704(R)

preparation and properties, 11: 4840(J), 13083(R)

preparation by ThO_2 carburization-chlorination and direct chlorination and by $Th(NO_3)_4$ denitration-chlorination, 11: 11696

preparation from oxides and oxalates, 11: 7416

vapor pressure and Th production, 11: 12992

Thorium(IV) chlorides

bomb reduction of, with Ca and Mg, 11: 13583

dissolution in PDA, 11: 8352(R)

electrolysis for Th metal production, 11: 8533

electrolysis from fused salts and purification, 11: 11493

heat of solution, effect of HCl concentration on, 11: 11493

preparation, 11: 7686(R), 8512(R)

preparation, thermodynamics, 11: 7417(R)

preparation and reduction, 11: 8411(R), 12333(R)

preparation by chlorination of ThO_2 and C, 11: 7673(R)

preparation by chlorination of ThO_2 at 550°C, 11: 7677(R)

preparation by direct chlorination of Th oxalate and reduction with Na amalgam, 11: 8352(R)

preparation of anhydrous, 11: 5772(J)

reaction with ThO_2 in molten salts, 11: 12672(J)

reduction by metallic thorium, 11: 10004(J)

reduction to Th amalgam in Metallex Process, 11: 12993(R)

reduction to Th by Na amalgam, 11: 7507(R)

thermodynamic properties of mixtures with Li and K chlorides, 11: 9994(J)

Thorium complexes

with aminopolycarbonic acids, high-frequency titration, 11: 9236(J)

Thorium compounds

bibliographies, 11: 10427

preparation and properties, 11: 10427

preparation and properties, review, 11: 8533

preparation of binary, from Th metal, 11: 11493

production and physical properties, 11: 11700(R)

protactinium separation and concentration, 11: 1001(J)

Thorium deposits

prospecting for, in Alaska and northwestern, western, and southeastern U.S., 11: 3825

Thorium deposits (U.S.)

bibliography on, 11: 11188

Thorium fluoride complexes

chemical properties, 11: 11493

Thorium fluorides

analysis, precipitation, and preparation, 11: 10812(R)

continuous recovery of U^{233} from irradiated, 11: 12987

electrophoretic deposition for preparing β-ray spectrometer sources, 11: 3622(J)

hydrolysis vs. particle size, 11: 4317

phase diagrams of sodium and potassium systems, 11: 8852(J)

precipitation, decay product distribution in, 11: 13635

precipitation by wet process, 11: 8508(R)

precipitation from aqueous solutions, 11: 3350(J)

precipitation from UO_2SO_4 solutions, 11: 8383(R)

preparation, 11: 8269(R)

preparation and chemical properties, 11: 4840(J)

preparation from oxides and nitrates, 11: 11701(R)

processing, for fission product removal, 11: 7710(R)

production of anhydrous, for metal production, 11: 11493

properties of fused salts based on, 11: 5205(J)

purification of Pa^{233} containing, 11: 7733(R)

pyrohydrolysis, 11: 9589(R)

reduction to Th, 11: 13589

removal of foreign cations from, 11: 13883(R)

thermal conductivity, 11: 13884(R)

vapor pressure, 11: 12666(R)

vapor pressure from 1128° to 1311°K, 11: 4812(R)

Thorium(IV) fluorides

bomb reduction, 11: 8507(R)

bomb reduction of, with Ca and Mg, 11: 13583

characteristics for breeder blanket application, 11: 7731(R)

hardness, 11: 8707(R)

hydrates, preparation and properties, 11: 5203(J)

preparation, 11: 4389(J)

preparation and sintering, 11: 8511

preparation by precipitation with HF, 11: 8507(R)

production from $Th(NO_3)_4$, process for, 11: 11571

reduction with calcium, 11: 7667

removal of Pa^{233} from irradiated, and sintering, 11: 7732(R)

sintering, 11: 7709(R)

specific heat, 11: 12359

thermodynamic properties, 11: 11563(R)

Thorium formates

laboratory preparation, 11: 13136

Thorium–gold alloys
See Gold–thorium alloys.

Thorium–hafnium alloys
See Hafnium–thorium alloys.

Thorium halides

electrolysis for Th purification, 11: 7144(R)

reduction to Th using Ca and $ZnCl_2$, 11: 7006(P)

Thorium hydrides

analysis, 11: 7455(R)

phase studies, 11: 11493

x-ray-diffraction analysis, 11: 8269(R)

Thorium–hydrogen systems
See Hydrogen–thorium systems.

Thorium hydroxide slurries

abrasive and corrosive effects on stainless steel loops and circulating pumps, 11: 8708(R)

Thorium hydroxides

adsorptive properties for ions in aqueous solutions, 11: 9869(R)

colloidal particles, dimensions of, 11: 912(J)

electroviscous effect in solutions, 11: 85(J)

hardness, 11: 8707(R)

laboratory preparation, 11: 13136

Thorium iodates

analysis of complexes, 11: 12330(R)

coprecipitation with rare-earth iodates, 11: 1469

precipitation from H_2O_2-tartaric acid medium, 11: 6263(J)

Thorium iodides

thermal stability, 11: 4812(R)

Thorium ions

conductometric analysis for free acid, 11: 5207

hydrolysis in ClO_4^- and Cl^- solutions and polymerization, 11: 8286(R)

organic solutions of $Th(NO_3)_4$, 11: 90(J)

Thorium–iron alloys
See Iron–thorium alloys.

Thorium isotopes
(Isotopes identified as ThA, ThB, etc., have been indexed as in the table below.)

For	See
$MsTh_1$	Radium isotopes Ra^{228}
$MsTh_2$	Actinium isotopes Ac^{228}
RdTh	Thorium isotopes Th^{228}
ThA	Polonium isotopes Po^{216}
ThB	Lead isotopes Pb^{212}
ThC	Bismuth isotopes Bi^{212}
ThC′	Polonium isotopes Po^{212}
ThC″	Thallium isotopes Tl^{208}
ThD	Lead isotopes Pb^{208}
ThX	Radium isotopes Ra^{224}

chemical effects on tissues and metabolism in animals, 11: 7055(J)

decay schemes, odd-parity rotational bands in even-even nuclei, 11: 13461(J)

measurement in sea waters, 11: 4870(J)

thermal neutron cross sections, review, 11: 10245

Thorium isotopes Th^{226}

alpha and γ spectra and decay schemes, 11: 780(J)

conversion-electron spectrum and energy levels, 11: 781(J)

Thorium isotopes Th^{227}

alpha, electron, and gamma spectra and decay scheme, 11: 12933

nuclear properties, 11: 11493

radiometric determination in human subjects by external counting, 11: 7291(R)

toxicology, 11: 893

Thorium isotopes Th^{228}

gamma spectrum, 11: 777(J), 2072(J)

Thorium isotopes Th^{228} (cont'd)

nuclear properties, 11: 11493

spectrum of intrinsic conversion electrons in active precipitation of, 11: 3605(J)

Thorium isotopes Th^{229}

half life, 11: 13576(R)

nuclear properties, 11: 11493

Thorium isotopes Th^{230}

electromagnetic separation, 11: 13836(R)

energy levels, 11: 9579(R)

extraction with organic solvents, 11: 7465

fission and spallation competition, 11: 12268

nuclear properties, 11: 11493

proton fission product yield, 11: 8191

radiochemical determination, 11: 13551(J)

Thorium isotopes Th^{231}

decay schemes, 11: 8999

nuclear properties, 11: 11493

Thorium isotopes Th^{232}

alpha reactions, excitation functions for, 11: 2254(R), 2629, 5538(J)

decay schemes, 11: 12639(R)

delayed neutrons from fission, 11: 4985(J), 13456(J)

deuteron reactions, excitation functions for, 11: 2629

deuteron reactions (d,2n) and (d,4n) from threshold to 190 Mev, excitation functions, 11: 13191

fast neutron cross sections, 11: 11564(R)

fast neutron fission yields of Kr and Xe isotopes, 11: 11268(J)

fission by deuterons and fast neutrons, 11: 9186(R)

fission by high-energy particles, 11: 12078(J)

fission rate measurements in CP-4, 11: 9780

half life, 11: 3051(J), 3535(J); 5374(J)

half lives, determination of, 11: 8001(J)

maximum permissible air concentration, 11: 7400(R)

neutron capture and production of Th^{233}, Pa^{233}, and U^{233}, 11: 8693

neutron capture cross sections, 11: 10244, 13837(R)

neutron capture cross sections below 1 Mev, fast, 11: 11386(J)

neutron cross sections, 11: 1618(R), 1636

neutron reactions (n,γ) and (n,2n), cross sections ratio for fission, 11: 11446

neutron resonance cross sections, Doppler effects on, 11: 9770

neutron resonance integrals, temperature coefficients of, 11: 13968(R)

neutron total cross sections and resonance parameters, 11: 9078(J)

nuclear properties, 11: 11493

photofission, 11: 1350(J), 4990(J)

photofission cross sections from 150 to 500 Mev, 11: 6880(J)

photoneutron emission, 11: 1350(J), 6547(J), 10319(J)

production efficiency of U^{233} by neutron irradiation of, 11: 12507

proton bombardment of, probabilities of symmetric and asymmetric fission in, 11: 12849(J)

proton fission product yield, 11: 8191

proton reactions, excitation functions for, 11: 2629

radiochemical determination, 11: 13551(J)

Thorium isotopes Th^{232} (cont'd)

spontaneous fission energy release, calculated, 11: 13444

thermal neutron cross sections and resonance absorption integral, measurements, 11: 12201(J)

Thorium isotopes Th^{233}

gamma spectra, 11: 7406(R)

neutron fission cross sections, thermal, 11: 6042(J)

production by neutron bombardment of Th^{232}, 11: 8693

production from neutron irradiation of natural Th, 11: 7866

spontaneous fission energy release, calculated, 11: 13444

Thorium isotopes Th^{234}

buildup and decay in breeder reactors, 11: 1373

isolation from $UO_2(NO_3)_2$, 11: 11986(J)

maximum permissible concentration in air, 11: 2238

nuclear properties, 11: 11493

recovery from cellulose pulp column, 11: 1493

separation, 11: 8283(R)

solvent extraction from UO_3 in HNO_3, 11: 13012

Thorium–lead alloys
See Lead–thorium alloys.

Thorium–magnesium alloys
See Magnesium–thorium alloys.

Thorium–magnesium alloys (liquid)
See Magnesium–thorium alloys (liquid).

Thorium–magnesium–zinc alloys
See Magnesium–thorium–zinc alloys.

Thorium–magnesium–zirconium alloys
See Magnesium–thorium–zirconium alloys.

Thorium–mercury alloys
See Mercury–thorium alloys.

Thorium minerals

age estimation from U/Pb isotopic ratios, 11: 6358

prospecting in U. S. and Canada for, 11: 3411(J)

Thorium–molybdenum alloys
See Molybdenum–thorium alloys.

Thorium–nickel alloys
See Nickel–thorium alloys.

Thorium–niobium alloys
See Niobium–thorium alloys.

Thorium nitrate–aluminum nitrate–hydrofluoric acid–nitric acid systems
See Aluminum nitrate–hydrofluoric acid–nitric acid–thorium nitrate systems.

Thorium nitrate–butyl phosphate–kerosene–nitric acid systems
See Butyl phosphate–kerosene–nitric acid–thorium nitrate systems.

Thorium nitrate–butyl phosphate–kerosene–water systems
See Butyl phosphate–kerosene–thorium nitrate–water systems.

Thorium nitrate–butyl phosphate–nitric acid systems
See Butyl phosphate–nitric acid–thorium nitrate systems.

Thorium nitrate–butyl phosphate–water systems
See Butyl phosphate–thorium nitrate–water systems.

Thorium nitrate–nitric acid systems
See Nitric acid–thorium nitrate systems.

Thorium nitrate–nitric acid–water systems
See Nitric acid–thorium nitrate–water systems.

Thorium nitrate–phosphoric acid systems
See Phosphoric acid–thorium nitrate systems.

Thorium nitrate–water systems

chemical stability at 300°C, 11: 13586

thermal stability, 11: 10973

thermal stability of, and use as breeder blanket in homogeneous aqueous reactor, 11: 5567

Thorium nitrates

analysis, fluorination, and solvent partition, 11: 10812(R)

analysis of aqueous solutions of, for TBP, 11: 8289(R)

chlorination to $ThCl_4$, 11: 12333(R)

crystallographic data for $Th(NO_3)_4 \cdot 5H_2O$, 11: 1451

denitration and chlorination, 11: 11696

distribution in organic solvents, 11: 90(J)

electrodialysis, 11: 11648

extraction with tributyl phosphate using a glass mixer-settler, 11: 9589(R)

fluorination to ThF_4, process for, 11: 11571

gamma decomposition, 11: 7859(R)

purification by countercurrent extraction, pilot plant, 11: 11493

purification by solvent extraction, mixer-settlers for, 11: 12964

purification by solvent extraction with tributyl phosphate from aqueous solution containing phosphate, sulfate, and HNO_3, 11: 11626

radiation chemistry, 11: 11576(R)

radiation-induced decomposition of, 11: 10027(J)

radiolysis due to reactor irradiation, 11: 8286(R)

radiolysis of N^{15}–enriched, in reactor breeding blankets, 11: 2111

recrystallization, 11: 13019(R)

separation from U nitrates by ion exchange, 11: 4372

solvent extraction using TBP, 11: 7481(R), 11125(J), 12986

thermal decomposition, 11: 972(J), 10811(R), 12404(R), 12991

uranium U^{233} separation and purification from solutions containing, 11: 7540

vapor pressure, 11: 6507(R)

Thorium–nitrogen systems
See Nitrogen–thorium systems.

Thorium ores

(See also Black sands; Monazites.)

particle sorting by degree of radioactivity, 11: 5100(P)

processing, 11: 12405(R)

processing for thorium recovery, 11: 3367(J)

recovery of Th from monazite sands, 11: 12360(R)

spectrophotometric analysis for Th using iodate precipitation, 11: 6263(J)

Thorium oxalate complexes

precipitation in the Bismuth Phosphate Process, 11: 8362

Thorium oxalates

calcination, drying, filtration, and precipitation, 11: 13589

chlorination, 11: 8411(R), 12991

chlorination to $ThCl_4$, 11: 8352(R), 12333(R)

chlorination to $ThCl_4$ in moving-bed reactor, 11: 7417(R)

precipitation, decay product distribution in, 11: 13635

precipitation, drying, and handling, 11: 11701(R)

precipitation from HNO_3 solutions, 11: 11493

preparation by reaction of HNO_3 and oxalic acid, 11: 8507(R)

preparation of powders of uniform particle size, 11: 11056

thermal decomposition, 11: 9589(R)

Thorium(IV) oxide–chromium oxide–water systems
See Chromium oxide–thorium(IV) oxide–water systems.

Thorium oxide foils

for neutron flux measurements, possibility of use, 11: 10909

Thorium oxide–molybdenum systems
See Molybdenum–thorium oxide systems.

Thorium oxide–niobium systems
See Niobium–thorium oxide systems.

Thorium oxide–nitric acid–phosphoric acid systems
See Nitric acid–phosphoric acid–thorium oxide systems.

Thorium oxide powders

characteristic properties, effects of preparation on, 11: 3805(J)

particle size distribution by a centrifugal sedimentation method, 11: 11257

Thorium oxide slurries

abrasive and corrosive effects on stainless steel loops and circulating pumps, 11: 8708(R)

abrasive effects, 11: 8707(R), 9469, 11493

abrasive effects on stainless steel, titanium, and Zircaloy-2, 11: 9720

abrasive effects on steel, 11: 7412, 12027(R)

cake formed during test, 11: 8276

caking theory and caking prevention, 11: 6747

catalytic effects on gas recombination, 11: 13656(R)

circulation systems, design of falling ball viscometer for, 11: 6782

corrosive effects, 11: 6536(R), 13985(R)

corrosive effects of circulating, 11: 12898(R)

corrosive effects of 28 μ, 1600° fired ThO_2 spheres, 11: 7990

corrosive effects on reactor components, 11: 2653, 9869(R)

corrosive effects on stainless steel, 11: 1862

corrosive effects on stainless steel, Au, Ti, Zr, Ti, and Zr Alloys, 11: 4692(R)

corrosive effects on stainless steel, Ti, and Sn–Zr alloys, 11: 8448

corrosive effects on stainless steel and Ti, 11: 1074

density, pressure bridge density meter for measuring, 11: 3466

density changes in, detection by γ-ray techniques, 11: 9734

density vs. temperature and concentration, 11: 2878

development for homogeneous reactor breeding blankets, 11: 12898(R)

development of reactor systems for handling, 11: 237, 4692(R)

development program summary, 11: 12541

dissolution by HNO_3–HF solutions, 11: 7838(R)

flow and corrosive effects, 11: 7859(R)

flow characteristics, 11: 238, 1036, 2430, 4425, 8737, 9469, 10532

flow properties of, and correlation between slurry concentration and yield shear stress, 11: 7598

heat exchanger design calculation for, 11: 10513

heat production rate in reactor blankets, 11: 2668

particle size determination, 11: 11586(R)

physical properties, applicability of Lumicon and x-ray fluoroscope techniques to study, 11: 8274

physical properties of, effects of electrolytes on, 11: 7415

physical properties of breeding blankets, effect on reactor design, 11: 12877

plating out of Ra daughters on stainless steel, Zr and Zircaloy, 11: 6405(J)

polarographic analysis for Ba, 11: 8296(R)

Thorium oxide slurries (cont'd)
power removal from boiling, 11: 7783, 7808
preparation, 11: 9582
preparation, properties, particle size measurement, and effects of irradiation on, 11: 7414(R)
preparation and properties, 11: 2896, 10292
preparation from Th oxales, formates, and oxycarbonates, 11: 8708(R)
processing, 11: 10292
properties, 11: 6092, 6536(R), 8631, 9863(R)
properties, effects of radiation on, 11: 13283
pumping, effects on properties of, 11: 11727
pumping in 1 in. glass loop up to 1.87 g ThO_2/g water, 11: 13355
radiation effects, 11: 7859(R), 7861(R), 10292
radiation effects on particles and double layer, 11: 4164
radiation effects on viscosity, 11: 4740, 13656(R)
recombination of radiolytic gases over, catalysts for, 11: 4265
resuspension velocity in round horizontal pipes, atmospheric pressure system for determining, 11: 10903
rheological properties, 11: 235, 4414
sedimentation and acidity, 11: 7859(R)
sedimentation at elevated temperatures, 11: 3570(J)
settling rates, particle size effects, 11: 11493
stability, 11: 9869(R)
thermal conductivity, 11: 13982(R)
thermal stability of sodium silicate treated, 11: 9755
viscosity, 11: 7167, 13985(R)
viscosity of various concentrations, 11: 7861(R)
Thorium oxide–uranium oxide slurries
radiation effects on viscosity, 11: 4740
Thorium oxide–uranium oxide systems
corrosion, 11: 11748(R), 13869(R)
corrosion in 316°C degassed water, 11: 13870(R)
density, fabrication, melting point, oxidation, and thermal shock, 11: 1064
dissolution, 11: 9718, 13582(R)
fabricating and firing techniques, 11: 4858(J)
fabrication and properties, 11: 10887(R)
fabrication and properties of, for high-temperature fuel elements, 11: 5704(J)
fabrication by wet milling, 11: 8462(R)
radiation effects, 11: 6713, 11748(R), 13869(R)
radiation testing of fuel pins, 11: 4664(R)
solubility in water, 11: 11746(R)
solubility in water at 600°F, 11: 11745(R)
thermal cycling and solution-irradiation tests, 11: 11747(R)
Thorium oxide–water-d_2 systems
heat transfer properties, 11: 7861(R)
nuclear properties, 11: 11762
Thorium oxide–zirconium oxide systems
crystal structure, constitution diagrams, and x-ray-diffraction analysis, 11: 259
phase studies, investigated by x-ray diffraction and dilatometric methods, 11: 12729(J)
Thorium oxide–zirconium systems
physical and mechanical properties, 11: 6713
Thorium oxides
abrasive effects of, against each other and against brass, stainless steel, and Zr in fluidized bed, 11: 8708(R)
absorption spectra, 11: 384
acid dissolution and particle size determination, 11: 11637(R)
adsorptive properties for inorganic acids and metal cations, 11: 11586(R)
adsorptive properties for water, 11: 10837
as a blanket material for thermal breeder reactors, evaluation, 11: 11761
carburization, 11: 11696
chlorination, 11: 10034
dissolution by HNO_3–HF and $(NH_4)_2SiF_6$, in stainless steel containers, 11: 8271
electrical conduction, effect of ion densities and mobilities, 11: 384
electrical properties, 11: 4854(R)
electrochemical processes in electrolysis in melted chlorides, 11: 3684(J)
fabrication and irradiation for U^{233} conversion, 11: 8287
fluidization, effects of erosion on, 11: 11761
hydrofluorination for ThF_4 production, 11: 13589
infrared absorption techniques for characterizing surfaces, 11: 8275
interfacial reactions with Ce and La, 11: 2851
neutron resonance escape probability and effective resonance integral, 11: 1616
particle size measurement by activation analysis–centrifugation, 11: 4426
physical properties of high-density, 11: 1858(J)
polarization potential, theory, 11: 384
preparation and properties, 11: 2896
preparation by hydrothermal decomposition of $Th(NO_3)_4$ solutions, 11: 13653(R)
preparation from Thorex product solutions, 11: 7414(R)
preparation of high purity, methods for, 11: 8823
purification, 11: 8823
radiation effects, 11: 13982(R)
reaction with $ThCl_4$ in molten salt solutions, 11: 12672(J)
reduction, 11: 11703(R)
removal of sulfate, 11: 7859(R)
resonance absorption of neutrons in cylinders, 11: 10335(J)
resonance neutron capture, 11: 8573
solubility and stability, 11: 8707(R)
solubility in HNO_3 and HNO_3–HF, 11: 8357(R)
spectrographic analysis, 11: 9579(R)
spectrophotometric analysis for Si, 11: 4300(J)
strength, density, and porosity, 11: 4427
surface electrical properties, effects of neutron radiation on, 11: 5669(J)
surface inspection by infrared spectroscopy, 11: 9896
thermal expansion measurements, 11: 3827(J)
tissue distribution following intravenous injection, 11: 11840
use of fluidized, as breeding blanket material, 11: 13900
Thorium(IV) oxides
analysis for SiO_2, 11: 12973(R)
carcinogenicity, 11: 1392

Thorium(IV) oxides (cont'd)
chlorination, 11: 8411(R)
dissolution, 11: 7859(R)
dissolution for determining U^{233}/Th ratio, 11: 7437
dissolution in HNO_3–HF and HNO_3–$(NH_4)_2SiF_6$, 11: 11493
particle-size measurements, 11: 12973(R)
physical properties of, for blankets, 11: 7858(R)
pilot plant production in Thorex Process, 11: 12318
precipitation in reactor blanket systems, 11: 7861(R)
preparation and properties, 11: 10292
preparation of, operating conditions and techniques for, 11: 13136
Reed requirement and specifications, summary sheets for, 11: 8273
reticulo-endothelial uptake, endocrine influences, 11: 5713(J)
spectral analysis by evaporation method, 11: 6288(J)
spectral determination of Cd, Zn, Tl, Sb, Bi, Ni, Ba, Na, and K by evaporation in, 11: 7119(J)
technology, 11: 683(J)
tissue distribution and excretion following administration to human patients, 11: 11904(J)
tissue distribution and radioactivity following injection in humans, 11: 2811(J), 3208(J)
Thorium(VI) oxides
properties, 11: 11493
Thorium oxychlorides
formation and solubility in molten solutions, 11: 12672(J)
Thorium peroxide sulfates
properties, 11: 11493
Thorium peroxides
preparation and properties, 11: 3687(J)
Thorium phosphates
crystal structure, x-ray determination, 11: 12001(J)
solubilization by NaH, 11: 12406(R)
Thorium powders
consumable-electrode arc melting for production of ingots, 11: 4887
explosive limits, handling, safety, and toxicology, 11: 6741
preparation by sintering ThH_4, 11: 12499(R)
purification, 11: 12491(R)
Thorium reserves (N. C.)
occurrence in Sandy Run Creek Area, 11: 4436
Thorium selenites
precipitation from H_2SO_4 and HNO_3, 11: 12299(J)
Thorium–silicon systems
See Silicon–thorium systems.
Thorium slurries
(See also Thorium hydroxide slurries; Thorium oxide slurries.)
corrosive effects and properties, 11: 8625
Thorium sulfates
corrosion inhibition, 11: 13985(R)
Thorium sulfides
lattice dimensions and density of Th_2S_3, 11: 8543(R)
phase diagrams, calculation for ThS-U and ThS-Ti, 11: 10565
preparation and properties, 11: 6290(J)
Thorium–titanium alloys
corrosion, mechanical properties, and phase studies, 11: 11703(R)
Thorium–uranium alloys
casting, 11: 13503(R)
decontamination by electric arc melting, 11: 12309
electric conductivity, hardness, microstructure, and x-ray diffraction data, 11: 10088
extrusion of Cu-jacketed, 11: 11698
high-temperature separation from fission products, 11: 10829(R)
liquid metal and molten salt extractions and volatilization, 11: 7546(R)
melting by arc-zone process for separation of fission products from irradiated, 11: 6295
metallurgical properties, 11: 8942(R)
phase studies, 11: 8507(R)
preparation, 11: 8481
preparation and microstructure, 11: 8487(R)
purification by arc-melting and molten salt extraction, 11: 8390(R)
pyrochemical processing, 11: 7549(R), 7550(R)
pyrochemical processing for fuel recovery and fission product decontamination, 11: 13680(R)
pyrometallurgical processing, 11: 3756(R), 7548(R)
removal of fission products by gravity flow through $CaCl_2$ beds, 11: 13292
resonance escape probability measurements in water moderated lattices, 11: 13514(J)
separation of fission products by volatilization, 11: 9639(R), 12487
separation of Pu and fission products from, 11: 7545(R)
solid solubility and extrusion, 11: 13042
solid solubility of U in, 11: 10088
strength, effect of U, 11: 13769
volatilization of fission products from irradiated, 11: 12487
Thorium–uranium alloys (clad)
radiation effects on U^{235}-enriched, 11: 9891
Thorium–uranium couples
strength, hardness, and metallographic inspection of bonding in, 11: 7847(R)
Thorium–zinc alloys
crystal structure of Th_2Zn_{17}, 11: 12778(J)
dezincing, 11: 13589
solubility of Th in liquid Zn, phase studies, 11: 11241(J)
Thorium–zirconium alloys
crystal structure, 11: 10560(R)
phase studies, 11: 4454(R), 7677(R)
phase studies above 900°C, 11: 7673(R)
properties, survey, 11: 9740
purification by zone melting process, 11: 1128
Thorotrast
See Thorium(IV) oxides.
Thulium
(See also Rare earths.)
absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969
heat of sublimation, 11: 4632(R)
ion exchange using ENTA, 11: 6302(J)
magnetic properties, 11: 4748
physical and chemical properties, 11: 5816(J)
Thulium isotopes
energy levels and multipole transitions in the lead region, compilation of data, 11: 13446(J)

Thulium isotopes Tm^{165}

half life, 11: 13114(R)

Thulium isotopes Tm^{167}

decay schemes, 11: 8549(R)

Thulium isotopes Tm^{169}

energy levels and spin and parity assignments, 11: 1648(J)

gamma spectra, angular correlation of 199-110 and 178-131 kev γ-γ cascades, 11: 5675(J)

rotational levels, 11: 1644(J)

Thulium isotopes Tm^{170}

applications for gamma radiography, 11: 890(J), 5850(J), 10521(R)

beta particle bremsstrahlung measurements, 11: 10266(J)

beta particles from, longitudinal polarization of, 11: 9459(J)

bone deposition in dogs, 11: 7291(R)

decay scheme, and uses in medical radiography, 11: 7078(J)

gamma sources for radiography, calibration, 11: 11311(J)

neutron absorption cross sections, 11: 4685(R)

nuclear charge distribution effects on β-γ angular correlation, 11: 8220(J)

production, 11: 10521(R)

Thulium isotopes Tm^{171}

rotational levels in, 11: 4045(J)

Thymonucleic acids
See Nucleic acids.

Thymus

lymphocytes, radiosensitivity to high doses of x radiation, 11: 11870(J)

radiation effects on acid phosphatase level in mice, 11: 1745(J)

regeneration of irradiated, in mice, 11: 5156(J)

Thyratrons
See Electron tubes.

Thyroid diseases

diagnosis by immediate uptake of I^{131}, 11: 72

radiotherapy of thyrotoxicosis with I^{131}, dose determination, 11: 3315(J)

therapy of hyperthyroidism with individually calculated doses of I^{131}, 11: 5178(J)

treatment of carcinoma with I^{124}, 11: 7079(J)

Thyroid gland

function tests, tracer methods, 11: 17(J), 63(J), 3680(J), 7695(R), 10803(R)

iodine metabolism, tracer studies, 11: 899(J), 900(J), 1590(J), 2810(J), 3487(J), 3676(J), 5132(R), 6471

iodine uptake measurement during surgery, 11: 1590(J)

metabolic effects, 11: 842(J), 4221

radioinduced ablation following administration of I^{131} to dogs, 11: 11845(J)

radioiodine clearance measurements, 11: 13255(J)

radioiodine uptake determined by in vivo measurements, 11: 12148(J)

radiosensitivity, 11: 3289(J), 4225, 4788(J)

radiosensitivity of rat, 11: 9918(J)

surgical removal in sheep, 11: 9190(J)

tumor induced by ingested I^{131} in sheep, 11: 6204(J), 11851(J)

tumors, a comparison of naturally occurring and I^{131} induced, in rats, 11: 6197

uptake of I^{131}, effects of brain condition on, 11: 10426(J)

uptake of I^{131} from fall-out by humans and cattle, 11: 9963(J)

Thyroxine

biosynthesis, effects of irradiation, 11: 4225

uptake of I^{131} labeled, and triiodothyronine by rat diaphragm, 11: 9977(J)

Thyroxine, triiodo-

uptake and retention of labeled, and thyroxine by rat diaphragm, 11: 9977(J)

Tidwell Quadrangle (Utah)

photogeologic map, 11: 1103(J), 1115(J)

Time measurement

(See also Chronographs.)

design of automatic timer for small current measurements, 11: 3921(J)

design of chronograph for, 11: 5493(R)

design of interval counting timer, 11: 7250(J)

design of millimicrosecond time analyzer, 11: 3471(J)

device for high precision, 11: 2564, 2571

plane parallel spark counters for, 11: 5416(J), 5417(J)

time-marker generator and a receiver, development of, 11: 2570

Timing circuits

design, for interval counting timer, 11: 7250(J)

design for a ten-channel time analyzer, 11: 1224(J)

design for 1024 channel neutron time-of-flight analyzer, 11: 1597(J)

design of high precision, 11: 2564

design of inductance-capacitance, 11: 6437

design to produce a timed sequence of events, 11: 9572(P)

for pulse analyzers, 11: 11300

pulse generator design for measuring short time intervals, 11: 12119(J)

time-marker generator and a receiver, development of, 11: 2570

Tin

carrier-free separation from deuteron-bombarded In, 11: 6305(J)

colorimetric determination in Sn–Zr–U alloys, 11: 6256

corrosion products on, bibliography, 11: 12031(J)

determination in Thorex Process streams, 11: 3697

effect of low temperatures on soft solder of, 11: 2523

electrodeposition on Th, 11: 13783

gamma reactions (γ,n), 11: 704(J)

gamma scattering at 1.33 Mev, 11: 6945(J)

gamma scattering from 50 to 130 Mev, 11: 5655(J)

K fluorescence yield, 11: 5545(J)

low temperature effects, 11: 6733

neutron scattering at 2.5 and 7.0 Mev, 11: 3035(J)

proton reactions, 11: 12855

photon reactions (γ,π), differential cross sections, 11: 10329

polarographic determination in Cu–Sn alloys, 11: 8296(R)

polarographic determination in Pu-bearing solutions, 11: 12346

polarographic determination in reactor solutions, 11: 12973(R)

proton-nucleus elastic scattering at 9.8 Mev, 11: 10258(J)

proton reactions, neutron yield from, 11: 1278(R)

reactions with Ce^{4+} in aqueous H_2SO_4 solution, kinetics, 11: 974(J)

secondary electron emissions from solid and liquid, 11: 1954(J)

separation from Ni, Cr, and Cu by selective precipitation, 11: 3633(P)

separation of Nb from, by means of 8-quinolinol, 11: 13294(J)

spectrophotometric determination in Sn–Zr alloys, 11: 6256

Tin (cont'd)
thermodynamic properties of Sn_2, 11: 11218
for use in ionization chamber construction, radiation effects, 11: 2456
use in recovery of Pu from U, 11: 5094(P)
volumetric determination in Zircaloy, 11: 12677
volumetric determination in Zr and Zr alloys, 11: 13269(J)
Tin (liquid)
velocity of sound measurements in, 11: 1181
Tin alloys
corrosion in 680°F water and 750°F steam, 11: 11711(R)
corrosion products on, bibliography, 11: 12031(J)
low temperature effects on solder, 11: 2523
preparation of mercury-free by amalgamation reactions, 11: 11927(J)
Tin–aluminum–titanium alloys
See Aluminum–tin–titanium alloys.
Tin–aluminum–zirconium alloys
See Aluminum–tin–zirconium alloys.
Tin–bismuth–lead alloys (liquid)
See Bismuth–lead–tin alloys (liquid).
Tin–boron–zirconium systems
See Boron–tin–zirconium systems.
Tin bromides
crystal structure investigation by means of nuclear quadrupole resonance, 11: 9363(J)
Tin bronze
See Bronze.
Tin chlorides
heat of formation, 11: 1419(J)
isotopic exchange with 2-chlorobutane, 11: 2822(J)
Tin–copper alloys
See Copper–tin alloys.
Tin–gold alloys (liquid)
See Gold–tin alloys (liquid).
Tin isotopes
Coulomb excitation by alpha bombardment, 11: 9189(R)
radioactivity, 11: 7430(R)
Tin isotopes Sn^{108}
disintegration properties, 11: 770
Tin isotopes Sn^{109}
radioactivity, 11: 3524
Tin isotopes Sn^{110}
disintegration properties, 11: 770
Tin isotopes Sn^{113}
decay scheme, 11: 9167(J)
decay scheme, γ spectrum, and electron spectrum, 11: 4066(J)
Tin isotopes Sn^{117}
decay scheme, γ spectrum, and electron spectrum, 11: 4066(J)
isomers, 11: 12970(R)
Tin isotopes Sn^{119}
half lives, 11: 8283(R)
isomers, 11: 12970(R)
Tin isotopes Sn^{121}
identification, 11: 8283(R)
Tin isotopes Sn^{123}
decay schemes, 11: 550(R), 2026(R)
gamma decay, 11: 10231(R)
Tin isotopes Sn^{125}
decay schemes, 11: 2026(R), 4746(J)
identification, 11: 8283(R)
Tin–lead alloys
See Lead–tin alloys.
Tin–lead alloys (liquid)
See Lead–tin alloys (liquid).
Tin–molybdenum alloys
See Molybdenum–tin alloys.
Tin–molybdenum–zirconium alloys
See Molybdenum–tin–zirconium alloys.
Tin–niobium–uranium–zirconium alloys
See Niobium–tin–uranium–zirconium alloys.
Tin–niobium–zirconium alloys
See Niobium–tin–zirconium alloys.
Tin–oxygen–zirconium systems
See Oxygen–tin–zirconium systems.
Tin–silver alloys
See Silver–tin alloys.
Tin–stainless steel–zirconium compacts
See Stainless steel–tin–zirconium compacts.
Tin–tantalum–zirconium alloys
See Tantalum–tin–zirconium alloys.
Tin–titanium–zirconium alloys
corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765
Tin–uranium–zirconium alloys
chemical analysis, 11: 13607
cladding techniques for fuel elements, 11: 12522
coextrusion, 11: 10901
colorimetric analysis for Sn, 11: 6256
corrosion, effect of Fe additions on, and heat treatment, 11: 6351
corrosion by 600°F water, 11: 12499(R)
corrosion resistance and microstructure, effects of heat treatment, 11: 9717
dissolution by HF, 11: 13579(R)
mechanical properties, effect of temperature, 11: 13772
Zr–clad, extrusion, 11: 11715(R)
Tin–zirconium alloy–stainless steel couples
See Stainless steel–tin–zirconium alloy couples.
Tin–zirconium alloys
activation induced during one cycle of MTR highest flux, 11: 2758
analysis for O_2, 11: 11587
anisotropy in impact properties of Zircaloy-2, 11: 12898(R)
annealing, 11: 2529, 2926
arc welding of vacuum- and inert-atmosphere-melted, 11: 9341(J)
bend tests, 11: 10569
brazements, corrosion resistance in 680°F water, 11: 8912(J)
brazing of Zircaloy-3, 11: 11198
burnout, 11: 1848, 5299
burnout data for inclined channels, 11: 12445

Tin–zirconium alloys (cont'd)

burnout of rectangular vertical channels, 11: 10865

chemical base coatings for, lubrication, and surface friction, 11: 2914

chemical reactions with water in pressurized water reactor, 11: 13600

cladding Mo–U reactor fuel rods with, 11: 8535

cladding with U, 11: 7681(R)

cleaning of Zircaloy-2 parts of PWR fuel elements, 11: 12520

co-extrusion with U alloys, 11: 11717

corrosion, 11: 4664(R), 11682(R), 11715(R), 12584(R)

corrosion, effect of C, N, cold working, and annealing on, 11: 8507(R)

corrosion, effect of cooling on, 11: 8524(R)

corrosion, effect of electron irradiation on, 11: 12462

corrosion, effect of Nb and Ta additions on, 11: 10873

corrosion, strength, and thermal conductivity for fuel element jacketing, 11: 13765

corrosion by biphenyl, 11: 2898, 5310

corrosion by boiler water, 11: 11747(R), 12898(R)

corrosion by $CuSO_4-H_2SO_4-UO_2SO_4$ systems, 11: 9287, 10529, 12460, 12461

corrosion by decontaminating solutions, 11: 8708(R)

corrosion by high temperature steam, 11: 3394(R), 4448(R), 10886(R)

corrosion by high temperature water, 11: 278, 2482, 3394(R), 4448(R), 4875, 8517(R), 13755

corrosion by $Li_2SO_4-UO_2SO_4$, 11: 11678, 11679, 12463, 13745

corrosion by reactor solutions, 11: 7861(R), 8449, 8706(R)

corrosion by reactor solutions and slurries, 11: 6092

corrosion by NaK, 11: 13746

corrosion by H_2SO_4 and HRT fuel solution, 11: 3809(R)

corrosion by thorium oxide slurries, 11: 8448, 8625

corrosion by UO_2SO_4 solutions, 11: 6536(R), 10531, 10533

corrosion by water, 11: 8719(R), 11183, 12057, 13059(R), 13060(R), 13746

corrosion by water, effects of nuisance elements on, 11: 10899(R)

corrosion during irradiation, 11: 10292

corrosion of, effects of chromate ion on, 11: 6349

corrosion of fuel rod cladding, heat effects, 11: 10983

corrosion of H_2SO_4 treated, in 300° water, 11: 7677(R)

corrosion of welded, effect of welding atmosphere and pickling, 11: 11184

corrosion product removal by $CrSO_4-H_2SO_4$, 11: 11680, 11681

corrosion resistance, effect of cold and hot drawing, 11: 2488

corrosion studies on bomb-reduced, 11: 11701(R)

corrosion testing, H_2 pickup during, 11: 13056

corrosion testing specifications, 11: 1073

corrosion tests at elevated temperatures, 11: 1870

creep, mathematical analysis, 11: 4452

creep and tensile properties, 11: 1129

creep in reactor process tubes, 11: 4683

creep properties of annealed and cold-worked Zircaloy-2, 11: 12317(R)

creep rupture and ductility in He atmosphere at 600, 700, and 800°F, 11: 10556

diffusion bonding to stainless steel, 11: 9475, 11199

dissolution, sonic effects, 11: 5889, 7197, 8943(R), 10111(R)

dissolution in fused $NaF-ZrF_4$, 11: 9580(R)

Tin–zirconium alloys (cont'd)

dissolution in H_2SO_4 catalyzed by HF, 11: 12663

drawing, 11: 11808(R)

eddy-current testing for fuel element cladding, 11: 1054

emissivities, 11: 4875, 11053(R)

erosion by ThO_2 slurries, effects of H_2 and $Na_4P_2O_7$ on, 11: 9720

extrusion, 11: 1521, 2538, 11719

extrusion, rocking, swaging, drawing, welding, and finishing, 11: 2498

extrusion and drawing, 11: 7646(R)

fabrication, 11: 12873

fabrication and heat treatment, 11: 1874

fabrication and tensile properties of Zircaloy-2, 11: 10301

fatigue notch sensitivity, 11: 2527

fretting wear of Zircaloy-2 clad pellets, 11: 3400

fuel rod cladding with, 11: 11717

grain growth, effects of strain and temperature on, 11: 9331

graphite melting, 11: 8518(R)

grinding, 11: 1154(J)

hardness, 11: 8717(R)

hardness and tensile strength, 11: 13059(R)

hot forming, 11: 2533

hydrogen migration and corrosion, 11: 11227

impact energy vs. temperature, 11: 12456(R)

impact tests, 11: 7859(R), 7861(R), 13060(R)

impact tests after exposure in UO_2SO_4, 11: 8708(R)

inspection of tubes by penetrant method, 11: 9876

interfacial reactions and corrosion, 11: 7640

internal and surface defects of Zircaloy 2 and 3 extrusion billet material, 11: 11200

malleability, 11: 2533, 3854

mechanical metallurgy, corrosion, and microstructure, 11: 4464(R)

mechanical properties, 11: 10986(R)

mechanical properties, effect of cold work on, and fabrication, 11: 2528

mechanical properties, effect of gases on, 11: 3419

mechanical properties, effects of temperature on, 11: 3418, 6365, 13772

mechanical properties, radiation effects on, 11: 8538, 10353(R)

mechanical properties, test procedures, 11: 12737

mechanical properties of annealed and cold-worked, 11: 13779(R)

melting, 11: 13805(R)

metallurgical studies of graphite-melted, 11: 8520(R)

oxidation testing by heating in air, 11: 1078

plating out of Ra daughters from ThO_2 slurries, 11: 6405(J)

preparation by bomb co-reduction, phase studies, and corrosion, 11: 8508(R)

preparation by reaction of molten Sn with Zr and phase studies, 11: 8507(R)

properties, evaluation as high-temperature high-pressure process tube and slug jacket material, 11: 11193

properties and welding, 11: 13516(J)

radiation effects on properties, 11: 8538

reaction of O_2 with, 11: 13582(R)

reaction with H_2O, high temperature, 11: 4875

removal by dissolution, 11: 7513(R)

Tin–zirconium alloys (cont'd)

solid state reactions between, and various reactor poison-bearing compounds, 11: 13881

spectrophotometric analysis, 11: 12676

spectrophotometric analysis for Sn, 11: 6256

stability of Zr_4Sn phase, effect of Ni, Cr, and Fe on, 11: 7673(R)

stress analysis as homogeneous reactor vessel, 11: 6074

stringer formation and shearability for Zircaloy-2, prevention and removal, 11: 2531

subcooled boiling burnout and heat transfer in vertical channels of Zircaloy-2, 11: 7597

tensile properties, 11: 13782(R)

tensile properties, anisotropy, metallography, and microstructure, 11: 11201

tensile properties, crystal structure, and radiation effects, 11: 6092

tensile properties, effects of annealing, 11: 1125

tensile properties, effect of welding Hf to, 11: 2534

tensile properties and corrosion, 11: 12473(R)

testing of PWR fuel element (Sn–Zr clad), 11: 7728

tubes, inert-W-arc butt welding, 11: 1876

tubing, production, 11: 11715(R)

volumetric analysis for Sn, 11: 12677

weld penetration of atmosphere vs. vacuum-melted, 11: 1522

welding, bend testing for straight butt joint, 11: 9282

welding, heliarc, 11: 11746(R)

welding channel sections, inert tungsten–arc process for, 11: 1881

welding of HRT core vessel, 11: 669(J)

welding of tubes, inert gas, tungsten arc, 11: 4894(J)

welding to Hf, 11: 13821

Tin–zirconium alloys (liquid)

high-temperature reactions with water, 11: 8916(R), 13574(R)

Tissue cultures

bone marrow, 11: 41(J), 5739(J)

effects of cosmic radiation, 11: 4782

growth stimulation by embryonic nucleoproteins, 11: 10391

of monkey brain cells, effects of γ irradiation, 11: 7908

preservation of bone marrow, 11: 9913(J)

single cell irradiation with microbeam of α particles, 11: 5146(J)

of tumor cells maintained in cheek pouch of hamsters, 11: 6196

Tissue homogenates

radiosensitivity effects, 11: 7923(J)

radiosensitivity effects in rats, 11: 830(R)

radiosensitivity effects of spleen and embryo in mice, 11: 12961(R)

radiosensitivity of respiration in rat duodenal mucosa, 11: 4239(J)

of rat spleen, effects of irradiation on enzyme activity, 11: 7915(J), 7916(J)

of spleen, therapeutic effects against radiation injuries in mice, 11: 6617(J)

Tissues

(See also Connective tissue; Placental tissues.)

analysis of beef for trace amounts of uranium, 11: 1434(J)

antigen content during radiation sickness, 11: 6621(J)

chemical effects of Th, Po, Sr, Ba, Y, Ce, and Pu on, 11: 7055(J)

cholinesterase level, radiation effects, 11: 3281(J)

Tissues (cont'd)

deposition of α and β-γ emitters in animal, following first atomic bomb detonation in New Mexico, 11: 12315

heavy particle damage, 11: 4245(J)

histology, effects on environmental temperature, 11: 10394

ligature application in radioinduced ulcers, 11: 3314(J)

neutron activation analysis for Na, K, and P, 11: 4315(J)

neutron dosage ratio to neutron flux, calculation, 11: 11864(J)

radioinduced changes in, of rabbits, 11: 6198(J)

radiometric analysis, sample preparation, 11: 52(R)

radiometric analysis for Po, 11: 109

radiosulfur S^{35} deposition in, and organs of human adults and young and adult rats, 11: 9978(J)

regeneration of muscular, effects of x radiation, 11: 849(J)

spectrographic analysis, 11: 7925, 7944

spectrographic analysis for the presence of various elements, 11: 6595

trace element concentration in human, determined by spectrographic survey, 11: 12636(J), 12637(J)

transplantation of erythropoietic, in irradiated rats, 11: 11879(J)

uptake and retention of labeled thyroxine and triiodothyronine by rat diaphragm muscle, 11: 9977(J)

Titanates

breakdown voltage, 11: 261(J)

ferroelectric properties, theory, applications, 11: 6750(J)

Titania

See Titanium(IV) oxides.

Titanium

absorptive properties of cold-worked, 11: 12898(R)

activation determination in Al alloys, 11: 1776

activation determination in NiO_3, 11: 8296(R)

alloying properties of Mo for, 11: 4479(J)

amperometric titration using m-nitrophenylarsonate, 11: 5797(J)

analysis for Fe, 11: 12973(R)

analysis for H, various methods for, 11: 1432(R)

analysis for Nb, Ta, W, Mo, Si, Be, and Ce, 11: 11224

analysis for oxygen, 11: 921, 6259

analysis for O_2 by electrode potential, 11: 12674

analysis of fission products from, 11: 7678(R)

anisotropy, effects of forming operations on, 11: 5341

anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)

availability of tubing, ducting, and fittings, 11: 11210

arc welding, 11: 5905(J), 6383

brazing, 11: 10096(J)

bromination for separation and determination of Ce, 11: 12675

casting, applications and requirements for, 11: 11211

chromatographic separation of, and Cr, 11: 10484(J)

cladding on steel, 11: 5875

coefficients of friction between, on steel and U, 11: 10092

colorimetric determination by thiocyanate, 11: 13579(R)

colorimetric determination in Pu–Ti alloys, 11: 5783(J)

cooling rates and thermal diffusivity, 11: 1886(R)

corrosion, 11: 7857(R), 8707(R), 12584(R), 12585(R)

corrosion, fabrication, oxidation, and physical metallurgy, survey of current reported research, 11: 351(J)

Titanium (cont'd)

corrosion and wear, data for water-cooled reactors, 11: 12028

corrosion by boiler water, 11: 12898(R)

corrosion by boiling aqua regia, 11: 12321(R)

corrosion by $CuSO_4-H_2SO_4-UO_2SO_4$ systems, 11: 10529, 12460, 12461

corrosion by fuel solutions, 11: 7861(R)

corrosion by fuming HNO_3, 11: 273(R), 1075(R)

corrosion by high temperature high purity H_2O, 11: 2903(J), 13067(R)

corrosion by liquid NaK, 11: 7727

corrosion by $Li_2SO_4-UO_2SO_4$ solutions, 11: 11678, 11679, 12463

corrosion by HNO_3–Pu solutions, 11: 3814

corrosion by HNO_3-UCl_3 and H_2O-UCl_3, 11: 11053(R)

corrosion by reactor solutions, 11: 6536(R), 8449, 8706(R), 9587(R)

corrosion by Thorex solutions, 11: 7487

corrosion by ThO_2 slurries, 11: 1074, 4692(R), 8448, 8625

corrosion by UO_2SO_4, 11: 6348(R), 7859(R), 8708(R), 8739, 9719

corrosion by water containing H_2O_2, 11: 8705(R)

corrosion during irradiation, 11: 10292

corrosion in homogeneous reactors, 11: 13982(R)

corrosion product removal by $CrSO_4-H_2SO_4$, 11: 11681

corrosion products of, bibliography, 11: 3817(J)

corrosion properties in various environments, 11: 1516, 1869

corrosion resistance in H_2SO_4, HCl, H_3PO_4, and HNO_3, 11: 7185

corrosion resistance properties, 11: 13326(J)

crystal structure, electrodeposition in fused alkali chloride baths, production, 11: 4459

crystal structure modification by addition of B, Mo, V, Zr, Bi, and Te, 11: 8016(J)

damping capacity as function of temperature and stress, 11: 12054

determination of latent heats of $\alpha \rightarrow \beta$ transition in, 11: 1902(J)

determination of Nb in large amounts of, 11: 10447(J)

determination of oxygen and nitrogen in, and Ti alloys by reaction with BrF_3, 11: 11086

development for use in HRT blanket, circulation and gas systems, heat exchanger, and pressure vessel lining, 11: 8604

development of, gears for aircraft and guided missile components, 11: 5325

diffusibility of β, for O_2, 11: 4472

dissolution by HF, H_2SO_4, HNO_3 and HCl, 11: 4470(J)

drawing, effect of die angle, speed, % reduction, and lubrication on forces in, 11: 11225

effect on properties of niobium alloys, 11: 4874

elastic constants of, applied to structural design, 11: 1135

electrical resistivity measurements for iodide, 11: 8511

electrochemistry, 11: 5756(R), 6229(R)

electrodeposition from Al–Ti baths, 11: 1137(R)

electrodeposition from fused salts, 11: 4873, 5351(J), 11985(J)

electrodeposition from nonaqueous media, 11: 3863(J)

electrodeposition from organic solutions, 11: 1898(J)

electrolytic refining, 11: 10100(J)

electroplating with metal coatings, 11: 11214

elongation, factors affecting, 11: 1526(R)

embrittlement due to temperature, 11: 9869(R)

emissivity vs. temperature, 11: 6381

Titanium (cont'd)

equilibrium between, and Ti chlorides in NaCl–KCl melts, 11: 3324, 10097(J)

equilibrium between $TiCl_2$, $TiCl_3$ and, in molten $NaCl-SrCl_2$, 11: 4477(J)

erosion by ThO_2 slurries, effects of H_2 and $Na_4P_2O_7$ on, 11: 9720

etching, thermal, 11: 8928(J)

evaluation of commercial, for powder metallurgy, 11: 13797

extrusions, mechanical properties, 11: 321, 1518, 5887

fabrication experience, 11: 8478

fabrication of a, lined pipe, 11: 3843

fatigue, 11: 302, 5347

fatigue properties, review, 11: 12747

fatigue properties of notched and unnotched, tabular summary, 11: 11208

fiber textures, correction factor for quantitative determination, 11: 359(J)

fires, extinguishing, 11: 4465

gamma absorption, 11: 10521(R)

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gamma reactions (γ,π^0), 11: 4115

gasometric determination of active, in Ti powders, 11: 5793(J)

glassed, metallographic examination, 11: 12475

gravimetric and colorimetric analysis for Si, 11: 7114(J)

hardness, effects of melting conditions and misch-metal additions, 11: 7195

hazards and safety precautions in fabrication and use of, 11: 272, 4465

heat-capacity measurements, 11: 314

heat transfer rates of tubes, 11: 11161

heat treatment, mechanical properties, preferred orientation, recrystalization, and rolling, 11: 1140(R)

heat treatment of large sections, 11: 1886(R)

hydridation and grain growth in O_2-H_2 recombiner loop, 11: 9721

hydrogen overpotential in, measurements, 11: 9995(J)

impact testing, 11: 13982(R)

industrial applications and research programs at Titanium Metallurgical Lab., Ohio, 11: 1134(R)

inspection of fabricated, 11: 9707

ionization potential difference and variable valence, 11: 11071(J)

isotopic dilution analysis for O_2, 11: 5792(J)

lubrication, 11: 11217(R)

lubrication and surface treatments, 11: 321, 2917

lubrication and wear resistance, 11: 8007(R)

mechanical properties, 11: 761, 1051, 3433(J)

mechanical properties, effects of neutron irradiation on, 11: 8930(J)

mechanical properties at very low temperatures, 11: 8006

melting by "auto-crucible" method, 11: 8517(R)

metal-lubricant systems, rating of diffused-type, 11: 8007(R)

metallurgical effects on Type 322 stainless steel, 11: 2536

metallurgy, 11: 8707(R), 11195

metallurgy and physical properties, 11: 7858(R)

metallurgy, properties, welding, and industrial uses of tubing, 11: 10101(J)

method and apparatus for obtaining ductile, 11: 8248(P)

microstructure, mechanical properties, effects of H on, 11: 6393

neutron activation, for reactor flux measurements, 11: 12519

Titanium (cont'd)

neutron cross sections, 11: 4973, 10229, 10247

neutron reactions (n,γ), 11: 13209

notch sensitivity, results of test program, 11: 7199

oxidation, mechanisms of, 11: 12745

oxidation at high temperatures, 11: 11224

oxidation by HNO_3, explosive nature of, 11: 272

phase studies, 11: 1120

photomicrographs, 11: 6739

physical properties, 11: 10561

physical properties, Hall coefficient and resistivity, 11: 392(J), 5342

physical properties, review, 11: 12056

physical properties, summary, 11: 1883, 6358

polarographic determination in homogeneous reactor solution, 11: 8285(R)

polygraphic behavior and determination of, in H_2SO_4, 11: 12678(J)

porosity, effects of temperature, strain, notches and impurity on, 11: 8923

potentiometric analysis for Cl^-, 11: 1440

powder metallurgy, compacting and sintering characteristics, 11: 10897

production, properties, and metallurgy, 11: 13341

production by Ca or Mg reduction of the halides and oxides, 11: 1538(R)

production by electrolysis of fused halide baths containing Ti salts, 11: 6404(J)

production by reduction of $TiCl_4$ with Mg and by electrolysis of fused salts, 11: 5351(J)

production from $TiCl_4$, 11: 10094(J)

production of shaped castings, melting furnaces, mold materials, and alloys for, 11: 2923

production of uncontaminated, by consumable-electrode arc-melting, 11: 4872

properties, uses, and methods of production, 11: 5352(J)

properties and uses, 11: 7209(J)

properties of, melted under high vacuum, 11: 1908(J)

purification by decomposition of TiI_4, reaction mechanisms, 11: 1531

purification by dissociation of TiI_4, 11: 8020(J)

radiation damage, 11: 1167(J)

radiation effects, 11: 8747(R)

radiographic inspection, 11: 10521(R)

recovery from monazites, 11: 8326(R)

recrystallization diagrams, effects of heat and compression on, 11: 355(J)

reduction with C and Si from oxides, 11: 1151(J)

relaxation, effect of grain structure on, test equipment, 11: 5344

residual stress in plates of, 11: 10566

rolling, 11: 11202

separation from Nb by 8-quinolinol, 11: 13294(J)

separation from Nb by precipitation, fusion, and solvent extraction, 11: 7673(R)

separation from Nb by solvent extraction, 11: 7677(R)

separation from Nb–Ta cupferron, 11: 1830(J)

separation from Ta, Mo, and W, 11: 3703

separation from Ta by precipitation with N-benzoyl-N-phenyl-hydroxylamine, 11: 7951(J)

sheet rolling program, 11: 5343

Titanium (cont'd)

slags, electroconductivity at temperatures up to 1470°C, 11: 3872(J)

solid solution hardening of alpha and beta, effect of alloying elements on, 11: 1885

solid state reactions between, and various reactor poison-bearing compounds, 11: 13881

solubility in Bi, 11: 9983(R)

solubility of Ce in, 11: 2931(J)

solvent extraction, 11: 11647(R)

solvent extraction from ferrous materials using acetylacetone, 11: 10442

specific heat, 11: 1176

spectrophotometric analysis for W using dithiol, 11: 7950(J)

spectrophotometric determination with 8-hydroxyquinaldine, 11: 119(J)

spectrophotometric determination with 8-hydroxyquinaldine and oxine, 11: 120(J)

spectrophotometric titration in Ti ores and metal, 11: 1441

spinning techniques for fabrication at elevated temperatures, 11: 11212

spot welding to metals, problems involved, 11: 374(J)

stability, effect of molten Ti on, 11: 5892

staining for metallographic examination, 11: 10091

stress relief, annealing, and reactions with O_2, N_2, and H_2, 11: 11209

surface friction, effect of surface chemistry and lubricants on, 11: 5325

surface hardening, bibliographies, 11: 6380

symposium on economics, analytical developments, and impurity control, 11: 2927(J)

tensile properties, 11: 6092

tensile properties, effects of microstructure on, 11: 8921

tensile properties and elasticity, effects of temperature on, 11: 5341

thermal neutron total cross sections, 11: 7826(R)

thermal properties, 11: 1120, 6379

thermodynamic properties, 11: 10563, 13335

twin intersections in, 11: 8958(J)

vacuum-fusion analysis for O_2, 11: 116(J)

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

valency determination from intermetallic compound structure, 11: 4885(R)

wear resistance, effect of lubrication, heat treatment, and surface properties on, 11: 5325

wear studies, 11: 11223

welding, 11: 13805(R)

welding characteristics studies by arc discharge with Ti electrodes, 11: 334

welding of cans for extrusion, 11: 9327

welding techniques, 11: 7861(R)

welding to Hf, 11: 6374

wire drawing and annealing tests, 11: 316(R)

Titanium alloys

alpha, effect of H_2 on, 11: 1160(J)

analysis for H, various methods for, 11: 1432(R)

analysis for molybdenum by precipitation from homogeneous solutions using thioacetamide, 11: 10001(J)

analysis for Nb, Ta, W, Mo, Si, Be, and Ce, 11: 11224

analysis for oxygen, 11: 921, 6259

anisotropy, effects of forming operations on, 11: 5341

Titanium alloys (cont'd)

colorimetric analysis for Be, 11: 935(J)

corrosion, 11: 11682(R)

corrosion by $CuSO_4-H_2SO_4-UO_2SO_4$ systems, 11: 10529

corrosion by reactor fuel solution in in-pile loop, 11: 12898(R)

corrosion by reactor solutions, 11: 6536(R)

corrosion by ThO_2 slurries, 11: 4692(R)

corrosion by UO_2SO_4, ThO_2 slurries, and mineral acids and in-pile corrosion, 11: 9869(R)

corrosion by UO_2SO_4 solutions, 11: 308, 7859(R)

corrosion in $UO_2SO_4-Li_2SO_4$, 11: 13745

corrosion properties in various environments, 11: 1869

corrosion rates, ignition sensitivity, and stress corrosion cracking in HNO_3 solutions, 11: 274

corrosion resistance, physical and mechanical properties, and fabrication, 11: 1518

corrosion resistance in H_2SO_4, HCl, H_3PO_4, and HNO_3, 11: 7185

creep and rupture under high temperature and stress, 11: 11220(R)

damping capacity, elastic properties, and fatigue at room and 600°F temperature, 11: 5345(R)

damping capacity as function of temperature and stress, 11: 12054

determination of O and N in, and Ti alloys by reaction with BrF_3, 11: 11086

development of, gears for aircraft and guided missile components, 11: 5325

ductility of forged, effect of heat treatment on, 11: 4476(J)

electrical resistivity and thermal conductivity, 11: 12490(R)

elongation, factors affecting, 11: 1526(R)

elongation and flow properties of α-β, effects of heat treatment and composition on, 11: 11213

embrittlement, strain aging, effect of H contamination on, 11: 2924

extrusions, mechanical properties, 11: 321, 5887

fabrication, heat treatment, and x-ray-diffraction analysis, 11: 3850(R)

fatigue properties, review, 11: 12747

fatigue properties of notched and unnotched, tabular summary, 11: 11208

formability, forging, heat treatment, melting, rolling, and tensile properties, 11: 5895

freezing segregation, factors affecting, theory, 11: 3848

gravimetric and colorimetric analysis for Si, 11: 7114(J)

hardness and tensile properties, effect of aging on, 11: 3850(R)

heat treatment, fatigue, and tensile properties of, for fasteners, 11: 7194

heat treatment, mechanical properties, and phase studies, 11: 7195

heat treatment, microstructure, 11: 6743

high-temperature properties, 11: 323, 4881

hydridation and grain growth in O_2-H_2 recombiner loop, 11: 9721

mechanical properties, and stability, factors affecting, 11: 6743

mechanical properties at very low temperatures, 11: 8006

mechanical properties, effect of various treatments on, 11: 1051, 3433(J), 6392

melting and metallurgy, 11: 3848

metallurgy, 11: 11195

metallurgy, properties, welding, and industrial uses of tubing, 11: 10101(J)

metallurgy and fabrication, 11: 13341

notch sensitivity, results of test program, 11: 7199

oxidation at high temperature, 11: 11224

Titanium alloys (cont'd)

paramagnetic susceptibility and valency, 11: 4885(R)

phase studies, 11: 3871(J), 4468

phase transition from β into ω and α, kinetics, 11: 12060(J)

physical properties, 11: 10561

physical properties, review, 11: 12056

physical properties, summary, 11: 1883

porosity, effects of temperature, strain, notches and impurity on, 11: 8923

preparation of thermosetting, 11: 6590(P)

production of shaped castings, melting furnaces, mold materials, and alloys for, 11: 2923

production of uncontaminated, by consumable-electrode arc-melting, 11: 4872

properties and uses, 11: 7209(J)

reduction with C and Si from oxides, effect of Mo, W, Cr, Al, Mn, and Ni on, 11: 1151(J)

relaxation, effect of grain structure on test equipment, 11: 5344

sheet rolling, mechanical properties, and temperature effects, 11: 5343

spinning techniques for fabrication at elevated temperatures, 11: 11212

stability, effects of temperature, stress, and H_2 contamination on, 11: 330(R)

staining for metallographic examination, 11: 10091

strength and tensile properties, effect of alloying elements and heat treatment on, development, 11: 1884(R)

stress, tensile properties, and heat treatment of, for aircraft parts, 11: 328(R)

stress corrosion of weldments in, at 700°F, 11: 12067(J)

stress relief, annealing, and reactions with O_2, N_2, and H_2, 11: 11209

structure, effect of Ce additions on, 11: 2931(J)

structure, use of electron microscope in study of, 11: 3853(R)

surface friction, effect of surface chemistry and lubricants on, 11: 5325

surface hardening, bibliographies, 11: 6380

tensile and elastic properties at temperatures to 1200°F and at various loading rates, 11: 3851(R)

tensile properties, 11: 2925, 4476(J), 5341, 13342

tensile properties at high temperatures, 11: 6740

testing, methods and evaluation, 11: 12020

testing failure in HRP-dump-valve trim, 11: 308

testing procedures for evaluation, 11: 8901

thermal conductivity, 11: 6379

wear resistance, effect of lubrication, heat treatment, and surface properties on, 11: 5325

welding, effect of additions of C, and N_2 on, 11: 6391(R)

welding and physical properties of Al–Mn–Ti and Al–Sn–Ti, 11: 4458

welding and preparation, 11: 333

wire drawing and annealing tests, 11: 316(R)

Titanium–aluminum alloys
See Aluminum–titanium alloys.

Titanium–aluminum–chromium alloys
See Aluminum–chromium–titanium alloys.

Titanium–aluminum–chromium–iron alloys
See Aluminum–chromium–iron–titanium alloys.

Titanium–aluminum–chromium–iron–molybdenum alloys
See Aluminum–chromium–iron–molybdenum–titanium alloys.

Titanium–aluminum–chromium–nickel alloys
See Aluminum–chromium–nickel–titanium alloys.

Titanium–aluminum–iron alloys
See Aluminum–iron–titanium alloys.

Titanium–aluminum–magnesium alloys
See Aluminum–magnesium–titanium alloys.

Titanium–aluminum–manganese alloys
See Aluminum–manganese–titanium alloys.

Titanium–aluminum–molybdenum alloys
See Aluminum–molybdenum–titanium alloys.

Titanium–aluminum–nickel alloys
See Aluminum–nickel–titanium alloys.

Titanium–aluminum–oxygen systems
See Aluminum–oxygen–titanium systems.

Titanium–aluminum–silicon systems
See Aluminum–silicon–titanium systems.

Titanium–aluminum–tin alloys
See Aluminum–tin–titanium alloys.

Titanium–aluminum–tungsten alloys
See Aluminum–titanium–tungsten alloys.

Titanium–aluminum–vanadium alloys
See Aluminum–titanium–vanadium alloys.

Titanium boride–chromium systems
See Chromium–titanium boride systems.

Titanium boride–nickel systems
See Nickel–titanium boride systems.

Titanium borides
cermets preparation with Fe, Ni, and Co, 11: 6716(J)
heat of formation, 11: 8909(J)
oxidation mechanisms, 11: 1070(J)
stability, effects of air, O_2, and N_2, on, 11: 5857(R)

Titanium borohydrides
preparation from $TiCl_4$ and $LiBH_4$, 11: 13575(R)

Titanium–boron carbide systems
See Boron carbide–titanium systems.

Titanium–boron systems
See Boron–titanium systems.

Titanium–boron systems (clad)
See Boron–titanium systems (clad).

Titanium carbide–nickel compacts
See Nickel–titanium carbide compacts.

Titanium carbide–tungsten systems
x-ray emission spectra, effects of chemical bond on, 11: 10525(J)

Titanium carbides
(See also specific systems containing carbon and titanium.)
bonding to steel, 11: 2476
chemical, physical, and mechanical properties, 11: 5856
hot pressed, gas-turbine application, physical properties, 11: 1065
impact behavior of, 11: 10557
oxidation mechanisms, 11: 1070(J)
preparation by reaction of Ti with CO_2, 11: 3850(R)
reinforcing in nichrome, effect on creep and slip, 11: 301
temperature effects on hardness and crystal structure, 11: 1155(J)
x-ray emission spectra, effects of carbon on, 11: 12727(J)
x-ray emission spectra, effects of chemical bond on, 11: 10525(J)

Titanium–carbon–iron systems
See Carbon–iron–titanium systems.

Titanium–carbon systems
See Carbon–titanium systems.

Titanium–cerium alloys
See Cerium–titanium alloys.

Titanium chlorides
electrolysis for Ti production, 11: 11985(J)
equilibrium between, and Ti in NaCl–KCl melts, 11: 3324, 10097(J)
equilibrium between Ti and, in NaCl–$SrCl_2$, 11: 4477(J)
production from ore or scrap, 11: 10094(J)
reduction by solutions of alkali metals in their fused chlorides, 11: 4459
reduction with Mg for production of Ti, 11: 5351(J)

Titanium–chromium alloys
See Chromium–titanium alloys.

Titanium–chromium–iron alloys
See Chromium–iron–titanium alloys.

Titanium–chromium–iron–molybdenum alloys
See Chromium–iron–molybdenum–titanium alloys.

Titanium–chromium–molybdenum alloys
See Chromium–molybdenum–titanium alloys.

Titanium–chromium–nickel alloys
See Chromium–nickel–titanium alloys.

Titanium–chromium–silicon systems
See Chromium–silicon–titanium systems.

Titanium–chromium–tungsten alloys
See Chromium–titanium–tungsten alloys.

Titanium coatings
electrodeposition from fused salt baths, mechanism, 11: 3862(J)
electrodeposition on metals and ceramics, 11: 12746
preparation by diffusion on Fe and steel, 11: 4891(J)

Titanium–cobalt alloys
See Cobalt–titanium alloys.

Titanium compacts
bend and tensile tests, effect of type of Ti powder on, 11: 13797
resistance sintering in air and argon, comparison of properties, 11: 12500

Titanium complexes
formation in aqueous solutions, 11: 206(J)

Titanium compounds
electrolysis for electrodeposition of Ti, 11: 3863(J)
polymerization, 11: 2876(R)
volumetric determination of $[(CH_3)_2CHO]\ Ti(C_8H_7O_2)_2$, 11: 207(R)

Titanium conferences
proceedings of IMD fall meeting, Cleveland, 1956, 11: 2927(J)

Titanium–copper alloys
See Copper–titanium alloys.

Titanium electrodes
characteristics of d-c arcs with W cathodes in inert gases, 11: 334
performance for arc welding, 11: 13346

Titanium films
optical constants and reflectance of opaque, 11: 3868
oxidation, 11: 3868

Titanium hydrides
heat-capacity measurements, 11: 314
x-ray emission spectra, effects of chemical bond on, 11: 10525(J)

Titanium iodides

vapor pressure of TiI_4 and TiI_2 from 750 to 902°K, 11: 1531

Titanium ions

spectrophotometric analysis, 11: 206(J)

Titanium–iron alloys
See Iron–titanium alloys.

Titanium–iron–nickel alloys
See Iron–nickel–titanium alloys.

Titanium–iron–silicon systems
See Iron–silicon–titanium systems.

Titanium isotopes

formation during irradiation of stainless steel, 11: 10554

neutron reactions (n,p), relative cross sections, 11: 5561(J)

thermal neutron reactions (n,γ), 11: 711(J)

Titanium isotopes Ti^{44}

decay properties, 11: 6159(J)

Titanium isotopes Ti^{46}

excited states of, upper limit for lifetimes, 11: 4980(J)

Titanium isotopes Ti^{48}

energy levels, 11: 13449(J)

Titanium isotopes Ti^{49}

decay properties, 11: 11576(R)

energy levels, 11: 626(J)

Titanium isotopes Ti^{51}

decay properties, 11: 626(J)

Titanium–manganese alloys
See Manganese–titanium alloys.

Titanium minerals

occurrence of brannerite in Rajasthan, India, 11: 1085(J)

occurrence of ilmenite and rutile, 11: 13341

Titanium–molybdenum alloys
See Molybdenum–titanium alloys.

Titanium–molybdenum–silicon systems
See Molybdenum–silicon–titanium systems.

Titanium–molybdenum–uranium alloys
See Molybdenum–titanium–uranium alloys.

Titanium–nickel alloys
See Nickel–titanium alloys.

Titanium–nickel–uranium alloys
See Nickel–titanium–uranium alloys.

Titanium–niobium alloys
See Niobium–titanium alloys.

Titanium nitrides

analysis for Cl, Fe, Ti, Mn, Mo, and N, 11: 92(J)

oxidation mechanisms, 11: 1070(J)

preparation from $TiCl_4$ and ammonia, hardness, effects of sintering temperature on, 11: 92(J)

x-ray emission spectra, effects of chemical bond on, 11: 10525(J)

Titanium oxide films

surface friction and wear resistance, 11: 2917, 11217(R)

Titanium oxide–silicon oxide systems
See Silicon oxide–titanium oxide systems.

Titanium oxide–silicon oxide–zirconium oxide systems
See Silicon oxide–titanium oxide–zirconium oxide systems.

Titanium oxide–uranium oxide systems

physical properties of sintered, 11: 7601

Titanium oxide–zirconium oxide systems

phase studies, physical and electrical properties, 11: 9284(J)

phase studies by x-ray diffraction on quenched complexes, 11: 5871(R)

physical, chemical, and electrical properties, 11: 8910(J)

Titanium oxides

(See also specific systems containing oxygen and titanium.)

corrosion, 11: 8707(R)

corrosion by UO_2SO_4, 11: 8911

evaporation, gaseous species in, 11: 550(R)

in glass, phase studies and properties of, 11: 3804(J)

neutron activation analysis for V, 11: 8296(R)

preparation, phase studies, and new modification of, 11: 1888(J)

spectrophotometric analysis for Ti, 11: 1441

testing for use as capacitor material, 11: 3387(R)

x-ray emission spectra, effects of chemical bond on, 11: 10525(J)

Titanium(IV) oxides

corrosion by uranyl sulfate solutions, 11: 7609

spectra, 11: 7455(R)

thermal conductivity, effect of microstructure on, 11: 12728(J)

thermodynamic properties, 11: 13335

Titanium–oxygen–silicon systems
See Oxygen–silicon–titanium systems.

Titanium–oxygen systems
See Oxygen–titanium systems.

Titanium–oxygen–zirconium systems
See Oxygen–titanium–zirconium systems.

Titanium–plutonium alloys
See Plutonium–titanium alloys.

Titanium powders

combustion and explosion aspects, 11: 4465

extrusion of Y-shaped rods, 11: 11706

gasometric analysis for active Ti, 11: 5793(J)

intersolubility with Pb at temperatures of 500 to 800°C, 11: 356(J)

Titanium–stainless steel couples
See Stainless steel–titanium couples.

Titanium sulfates

analytical use as reductant in oxidimetric titration of U, 11: 7952(J)

Titanium–thorium alloys
See Thorium–titanium alloys.

Titanium–tin–zirconium alloys
See Tin–titanium–zirconium alloys.

Titanium–tungsten alloys

phase studies, 11: 4468

Titanium–uranium alloys

casting and fabrication, 11: 13766

corrosion, 11: 7662, 13042

creep strength at 1500 to 1800°F, 11: 12630

heat treatment, 11: 12473(R)

heat treatment, mechanical and physical properties, and microstructure, 11: 11695

phase studies, 11: 7662(R)

preparation, forging, rolling, and thermal rupture, 11: 9732

tensile properties, 11: 13042

Titanium–uranium–zirconium alloys

microstructure, phase studies, and crystal structure, 11: 10099(J)

Titanium–vanadium alloys

cooling rates and thermal diffusivity, 11: 1886(R)

density, melting point, cooling curves, tensile properties, hardness, microstructure, and purification, 11: 8507(R)

emissivity curves in temperature range 1470 to 2900°F, 11: 6381

heat treatment of large sections, 11: 1886(R)

mechanical properties and microstructure, effect of α-β ratio and heat treatment on, 11: 12750

phase studies, 11: 4468, 8508(R)

welding, effects of additions of C, and N_2 on, 11: 6391(R)

Titanium–zirconium alloys

corrosion by degassed water at 360°C and thermal conductivity, 11: 11688(R)

neutron- and x-ray-diffraction analysis, 11: 7630(R)

phase studies, 11: 4468

tensile strength at 650°C, 11: 7626(R)

thermodynamic properties, 11: 10563

Titanium–zirconium oxide systems

microstructure, 11: 5892

Titration equipment

(See also Laboratory equipment; Remote-control equipment.)

for coulometric determination of Pu, 11: 13272(J)

design of remotely controlled, 11: 7126

performance of an automatic differential titrator, 11: 929

TNT

See Toluene, trinitro-.

Toluene

coolant properties for reactor shielding, 11: 8687(R)

diisocyanate, toxic effect on respiratory passages, 11: 4803(J)

scintillation light output of solutions and plastics, 11: 2026(R)

Toluene, p fluoro-α-iodo-

exchange reactions of I_2 between potassium iodide and, 11: 76

Toluene, trinitro-

detonation velocity transients, 11: 909

Toluenesulfinic acid, hafnium salts

solubility in HCl solution, 11: 2406

Toluenesulfinic acid, iron(III) salts

solubility in HCl solution, 11: 2406

Toluenesulfinic acid, thorium salts

solubility in HCl solution, 11: 2406

Toluenesulfinic acid, uranium(IV) salts

solubility in HCl solution, 11: 2406

Toluenesulfinic acid, zirconium salts

solubility in HCl solution, 11: 2406

Toluenesulfonic acid, triphenylethyl esters

molecular rearrangements, 11: 9587(R)

Toluidine

molecular orbital energy levels, charge distribution, and mobile bond order, 11: 6003(J)

Tongue River Formation (S. Dak.)

lignite deposits, 11: 4434

Tools

See Cutting tools.

Tophet A

See Chromium–nickel alloys.

Topsy

See Critical assemblies.

Total cross sections

See Neutron total cross sections.

Tour (Sam) and Co., Inc., New York

progress reports on protective coatings for steel, testing, 11: 3385(R), 3386(R)

Tower Shielding Facility

criticality studies, 11: 13140

dose rate data from, application to higher altitudes, 11: 552

gamma shielding of fuel elements in, 11: 13214

Toxins

anti-, x-radiation effects on development of diphtheria, 11: 3662(J)

formation in blood of irradiated rats, 11: 831

Tracer techniques

(See also Radioisotopes; Stable isotopes.)

handbook, 11: 5420

instrumentation, 11: 1256(J)

method for assay of compounds doubly labeled with H^3 and C^{14}, 11: 9008(J)

Tracer techniques (agriculture)

applications in mineral metabolism studies, 11: 5750(J)

conference on, 11: 4804

European program in 1956, 11: 11903

Tracer techniques (biology)

applications in biological and medical research, 11: 17(J), 520(J), 6629(J), 8818(J)

application in blood circulation studies using Na^{24}, 11: 9207(J)

applications in cancer research, 11: 7081(J)

applications in clinical studies on metabolism, 11: 902(J), 2812(J)

applications in medical research, 11: 6221(J), 11905(J)

applications in studies of phosphorus^{32} dispersion in biological systems, 11: 9208(J)

clinical diagnostic techniques, 11: 11901(J)

counting equipment for in vivo studies, 11: 1584(J), 1593(J)

counting techniques, 11: 10194(J)

effects of radioactive contamination of foodstuffs due to fall-out on results in animal experiments, 11: 7084(J)

employing small laboratory animals, temporary storage of radioactive carcasses, 11: 4263(J)

linear kinetics and formulation of models, invariants in experimental data on, 11: 1412

methods and theory, book, 11: 11910(J)

review of recent developments, 11: 5753(J)

routine determination of S^{35} in biological materials, 11: 13275(J)

in tracing sewage introduced into sea and coastal waters, 11: 11906(J)

Tracer techniques (botany)

applications in studies on absorption from solution by fibrous materials, 11: 210(J)

applications in studies on photosynthesis, 11: 12661

controlled-environment growth chamber for use in, 11: 3322

Tracer techniques (chemical engineering)

applications in boundary layer studies, 11: 1039

Tracer techniques (chemistry)

applications in investigations of reaction mechanisms, 11: 10488(J)

Tracer techniques (chemistry) (cont'd)

applications in synthesis with carbon isotopes, 11: 10043

errors resulting from isotopic dilution after synthesis, 11: 5279(J)

reaction mechanisms, 11: 210(J)

study of relative migratory tendencies of phenyl and P-tolyl groups in pinacol rearrangement of 1, 1, 2-triarylethylene glycol system, 11: 10435

Tracer techniques (engineering)

in cutting tool and piston ring wear tests, 11: 12009(J)

in distribution of fuel additives in gasoline engine intake systems, 11: 9181(J)

industrial applications, 11: 520(J)

industrial applications in studies of flow patterns, 11: 3802(J)

Tracer techniques (geology)

measurement of isotopic abundance in ground water streams, 11: 12755(J)

preparation of Sb^{124}-labeled dynamite for use in tracer studies in mines, 11: 1508

Tracer techniques (metallurgy)

applications for measuring wear in ball bearings, 11: 7173(J)

applications in metal research, 11: 1535

employing P^{32}-labeled ferrophosphorus as tracer, 11: 1143(J)

high-resolution radioautography applied to, 11: 4882

Tracerlab, Inc., Boston

progress reports on nuclear batteries, 11: 2, 448(R), 449(R), 450(R)

Tracks
See Particle tracks.

Tradescantia

chromosome aberrations in, effect of ultraviolet radiation, 11: 8775(J)

radioinduced chromosome aberrations in, 11: 861(J), 7049(J)

radioinduced chromosomal aberrations in, effects of cation imbalance, 11: 13238(J)

Trajectories
See Particle trajectories.

Transducers

overload characteristics of pressure, and monitor amplifier, 11: 3910

response of fast differential pressure, effect of changing pressure signals, 11: 3467

reversible digital transducer and counter design, 11: 2574

Transformation temperatures

(See also Phase studies.)

photorecording apparatus for analysis, 11: 2966(J)

Transformers

(See also Pulse transformers.)

design and manufacture for nuclear applications, 11: 6448(J)

development of ultra-high temperature miniaturized power, 11: 12791(R), 12792(R), 12793(R)

tests to determine operating conditions for use of water spray for energized electrical, 11: 2884

Transfusions
See Blood transfusions.

Transistors

applications in nucleonics, 11: 2961

applications of Si, low-gain region, 11: 6779

behavior in magnetic fields, 11: 2563

capacitor charging circuits with, equations for circuit analysis, 11: 8972

gamma irradiation of Ge and Si, 11: 3597

Transistors (cont'd)

Peltier cooling effect, application, 11: 1175

performance in plug-in decade counters, 11: 11298

performance in radiological survey instruments, 11: 3957

physics, effect on science of semiconductors, 11: 3880(J)

power amplifiers using switching, 11: 6442

in radiation detection instruments, 11: 9007(J)

as radiation detectors, 11: 8092(J)

radiation effects, 11: 1922(R), 8945(J), 11469

radiation effects on Ge, 11: 3205

use in G-M survey instrument, 11: 1241

Transmitters
See Pressure transmitters.

Transplutonic elements

(See also Americium; Berkelium; Californium; Curium; Einsteinium; Fermium.)

preparation, isotopic half lives, and properties, 11: 9266

Transuranic elements

(See also Americium; Berkelium; Californium; Curium; Einsteinium; Fermium; Neptunium; Plutonium.)

absorption spectra in crystals and solutions, 11: 7430(R)

chemical properties and determination, 11: 2831

chemistry and methods of separation, 11: 168(J)

Traps

(See also Filters; Vacuum systems.)

anti-icing shield for cold, 11: 3924(J)

bubblers, electrostatic precipitators, and condensers, evaluation for Na removal, 11: 3685

heat transfer in, by fission products in gas stream from reactor, 11: 2428

heating in HRT, from radioactive fission product gases, 11: 13909

performance, 11: 9478(R)

testing mechanically refrigerated and activated carbon, for use with line recorders, 11: 13847

Trauma

effects on serum transaminase level, 11: 10396

resistance in rats, effects on radiosensitivity, 11: 5159(J)

1,2,4-Triazole, 3-hydrazino-5-thiol-

crystal structure, 11: 1781

Tribenzylamine

solvent properties, 11: 9662

Tributyl phosphate
See Butyl phosphates.

Tributyl Phosphate Process
See TBP Process.

Tributyl Phosphate Process (Canada)

(See also Purex Process.)

modification to accommodate Pu–Al alloys, 11: 7141

Trichinosis

control, by irradiation of parasites and pork, 11: 3274(R)

Trimethyl borate
See Methyl borate.

Trinitite
See Radioactive minerals.

fall-out monitoring, 11: 13247, 13565(R)

Triphenylmethyl groups
solvolysis of fluoride, 11: 12186(R)
Tritium
absorption and toxicology in man, 11: 6226(J)
applications in biological research, 11: 17(J)
applications in chemical research and industry, 11: 210(J)
beta counting methods for measuring, 11: 5499(J)
beta emission, excitation following, 11: 550(R), 2026(R)
beta rays from, effects on Serratia indica, 11: 1733(J)
binding energy, effect of hard core on, 11: 13475(J)
binding energy calculations, 11: 5556(J)
chemical effects in isomerization of cyclopropane, 11: 7095(J)
determination by counting in glass proportional counting tubes, 11: 12144(J)
determination in compounds doubly labeled with H^3 and C^{14}, 11: 9008(J)
determination in water, development of liquid scintillator for, 11: 6841(J)
deuteron reactions, 11: 707(J), 1349(J)
deuteron reactions (d,n), excitation function, 11: 12196(J)
distribution, production rate, and possible solar origin of natural, 11: 5701(J)
distribution in nature of cosmic ray produced, 11: 8001(J)
distribution in tissue, 11: 8261(R)
distribution of artificially produced, in nature, 11: 5374(J)
elastic scattering of protons by, 11: 2093(J)
handling, health hazards, 11: 3668
lifetime of H^3_Λ hyperfragments, 11: 5506(J)
measurement in meteorites by neutron activation, relation to cosmic radiation, 11: 8000(J)
mechanism of labeling organic compounds with, 11: 5132(R)
molecular spectra, fine structure in, 11: 7406(R)
monitoring in air, 11: 3488(J)
monitoring of surface-adsorbed, by detection of β particles, 11: 2598
neutron spectrum from T + t, 11: 10385(J)
photodisintegration, sum rules for, 11: 10261(J)
physical properties and analysis, bibliographies, 11: 3952
production by Castle operation and cosmic rays, 11: 2220
production by $Li^7(\gamma,\alpha)$, 11: 9752(R)
production by neutron irradiation of LiF, 11: 13687
protection against contamination by, plastic suits for, 11: 11035
radiometric, spectrographic, and mass spectrometric determination in H_2, 11: 13687
radiometric determination, 11: 1449, 1989(J), 2243(R), 2273, 2274, 2610, 3677(J), 3701, 4806(J)
reactions with stopcock grease on storage, 11: 2270
spectra, 11: 9579(R)
spectrographic analysis, 11: 6575(J)
storage and delivery, device for, 11: 4327
tissue distribution and pathological effects following inhalation of high concentrations, in mice, 11: 19
as tracer in cholesterol metabolism studies, 11: 5182(J)
tracer techniques, water motion studied by, 11: 2220
Tritium compounds
bibliography on, 11: 11998
kinetics of Redox reactions, review, 11: 4832
Tritium compounds (cont'd)
labeled by self-irradiation, preparation, 11: 13301(J)
labeled by self-radiation, preparation and properties, 11: 13229(R)
organic, preparation, 11: 12642(R)
solvolysis reactions, bibliographies, 11: 133
Tritium hydrides
See Hydrogen tritides.
Tritium oxides
(See Water-t; Water-t_2.)
Tritium–palladium systems
See Palladium–tritium systems.
Tritons
deuteron reactions (d,n), tables of angle and energy relationships, 11: 592
diffusion of 3.8 Mev, by protons, 11: 9503(J)
emission, nuclear photoeffect during, 11: 556(J)
mesonic decay in flight of hyperfragment, 11: 1694(J)
neutron spectrum from T + t, 11: 10385(J)
proton reactions (p,n), tables of angle and energy relationships, 11: 592
Trucks
See Vehicles.
TRX Reactor
design of, and criticality studies with, 11: 12603
measurement of f, p_c and ϵ for UO_2-fueled lattices for, 11: 11434
TTA
See Acetone, thenoyltrifluoro-.
TTR
See Hanford Thermal Test Reactor; KAPL Thermal Test Reactor.
Tuballoy
See Uranium.
Tubes
(See also specific types of tubes, e.g., Electron tubes; Geiger-Mueller tubes.)
bubble behavior in liquids flowing in "U", 11: 13709
burnout data for Ni, 11: 10063
cleaning of carbon and low-alloy steel and stainless steel pipe and tubing for nuclear coolant systems, 11: 13337
eddy-current testing of Zircaloy, 11: 1054
energy absorption and cushioning characteristics of steel, 11: 6340
extrusion of BeO, 11: 8472
extrusion of Zircaloy, for in-pile pressure, 11: 1521
fabrication and corrosion properties for Redox plant, 11: 3396
film formation rates in Clinton Reactor, effects of radiation on, 11: 7741
heat transfer rate of, of Ti, Cu–Ni, admiralty brass, and Hastelloy, 11: 11161
heat transfer to non-Newtonian fluids for laminar flow through, 11: 6335(J)
inspection by eddy current and immersed ultrasonic techniques, 11: 4464(R)
leak testing, 11: 5845
metallography of HRT leak detector, 11: 4876
porous, heat transfer from fluid stream, 11: 6328
residual stress in thin-walled, graphical method, 11: 10566
small diameter, eddy-current inspection, 11: 5847(J)

Tubes (cont'd)

stress and axial variation in temperature in the attachment of header to tube, 11: 2416

thermal conductivity, materials, and standard sizes, 11: 1042

thermal stress distribution in long, thin-walled, 11: 13149(R)

welding methods for, to headers in heat exchangers, 11: 5873

Zircaloy-2, inert-W-arc butt welding, 11: 1876

Tubular Reactor Assembly
See Aircraft reactor critical experiments.

Tumors

(See also Bone tumors; Brain tumors; Carcinomas; Sarcomas.)

biological protection against x rays in radiotherapy of, in rats, 11: 10419(J)

chemotherapy, a bibliography of agents, 11: 1722(J)

diagnosis of malignant melanoma of eye by I^{131}-uptake, 11: 7927(J)

effects of x radiation on nucleic acid synthesis in rats, 11: 9971(J)

estrogen induced in mice, 11: 840(J)

of eye, diagnosis by P^{32} uptake, 11: 2809(J), 7928(J)

of eye, radiotherapy employing radon and Co^{60} sources, 11: 6622(J)

growth, effects of deuteration in mice, 11: 8777(J)

growth, effects of fat-free diet in mice, 11: 12959(R)

growth, effects of radiation, 11: 5140(J)

growth characteristics of chloroleukemia in rats, 11: 4781(R)

growth of ascites, in rats, 11: 7910(R)

growth of ascites, inhibition by D_2O, 11: 7091(R)

growth of transplanted osteogenic sarcoma in rats, 11: 5136(R)

intraocular, radiodiagnosis, 11: 8817(J)

of lip, radiotherapy with Co^{60} applicator, 11: 6623(J)

of lungs, radiation dosage determinations, 11: 2803(J)

malignant, diagnosis and therapy, 11: 7081(J)

morphology of osteogenic sarcomas, 11: 9916(R)

nucleic acid metabolism, 11: 1721(J)

nucleic acid synthesis in mouse, effects of irradiation, tracer study, 11: 3653(J), 3654(J), 3655(J)

radioinduced, 11: 37(J), 44(J), 840(J), 1392, 2786(J), 3288(J), 5729(J), 6204(J), 8786(J), 8787(J)

radioinduced, in sheep thyroid gland following ingestion of I^{131}, 11: 11851(J)

radioinduced in man, 11: 9940(J), 11850(J)

radioinduced in monkeys, 11: 13230

radioinduced in rats, 11: 6610(J), 13232

radiosensitivity, factors affecting, 11: 25(J), 26(J), 1741(J), 6196, 6220

radiosensitivity, influence of oxygen level, 11: 11890(J), 11891(J)

radiotherapy, 11: 12655, 13234

radiotherapy, applications of Au^{198}, 11: 8810(J), 8811(J)

radiotherapy, applications of radioisotopes for, 11: 59(J), 61(J), 62(J), 63(J), 891(J), 1732(J), 2802(J), 3317(J), 3318(J), 3320(J), 3672(J), 4258(J), 4259(J), 4798(J), 4799(J), 6217, 6218, 10421(J)

radiotherapy, augmentation of effects by chemotherapy, 11: 11897(J), 11899

radiotherapy, clinical results employing a kilocurie Cs^{137} teletherapy machine, 11: 11900(J)

radiotherapy, effects on general resistance of host, 11: 7080(J)

radiotherapy, research program, 11: 8806

radiotheraphy, use of Manchester trunk bridge in, 11: 9972(J)

radiotherapy of malignant, by betatron, 11: 11895(J)

Tumors (cont'd)

radiotherapy with Co^{60} teletherapy, 11: 13251(J)

of spinal cord, detection by radioisotope myelography, 11: 7083(J)

therapy with radiation and chemicals, 11: 10418(J)

of thyroid gland, a comparison of naturally occurring and I^{131} induced, in rats, 11: 6197

transplantation in rats, 11: 13234

x-ray dosage in bone, effects of phosphatase and calcium deposits on, 11: 9970(J)

Tungstate ions

as corrosion inhibitors, electrochemical properties, 11: 11576(R)

Tungsten

absorption and ionization of Na on hot, 11: 8022(J)

activation analysis for trace impurities, 11: 8843(J)

adsorptive properties for, and mobility of H_2 on, 11: 7150(J)

alloying effects on high-temperature rupture strength of ferritic steel, 11: 1168(J)

Auger electron ejection by noble gas ions, 11: 1294(J)

colorimetric determination by thiocyanate, 11: 13579(R)

colorimetric determination in U–Ta–W alloys using hydroquinone, 11: 8847(J)

Coulomb excitation by N ions, γ rays from, 11: 4067(J)

Coulomb excitation of, angular distribution of γ rays from, 11: 8157(J)

determination of O_2, H_2, and N_2 in, 11: 10445(J)

electrodialysis, 11: 987

electron reflection from surfaces, 11: 1953(J)

emissivity, spectral, 11: 13358(R)

evaporation, purification, and radiant intensity, 11: 1920(R)

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gamma reactions (γ,n), 11: 704(J)

gravimetric determination in U–W alloys, 11: 9997

internal friction and Young's modulus, apparatus for precise determination at elevated temperature, 11: 12123(J)

neutron activation, effects of B^{10} additions on, 11: 5878

neutron elastic scattering at 3.3 Mev from, angular distribution and polarization, 11: 3593(J)

photometric determination of rhodanide complex of, 11: 10446(J)

proton reactions, neutron yield from, 11: 1278(R)

qualitative determination in Pt–U alloys, 11: 3341

radiation effects, 11: 8747(R)

reflection of secondary electrons from pure, and Ba-, Ag-, and D_2-coated, 11: 3455(J)

separation with Mo from Ta, Ti, Nb, and Zr, 11: 3703

solvent extraction, 11: 6237(R)

solvent extraction from ferrous materials using acetylacetone, 11: 10442

spallation by cosmic radiation, 11: 12772(J)

spectral emissivity, 11: 8025(R)

spectrophotometric determination in Ta, Ti, and Zr, using dithiol, 11: 7950(J)

spectrum of inelastically scattered neutrons from, 11: 10910

thermal capacities between 4 and 15°K, 11: 3423(R)

volumetric determination using Pb reductor, 11: 13581(R)

wetting by molten Pb or Bi, treatment for, 11: 3247(P)

work function of, effect of adsorbed film of dipole molecules, 11: 378(J)

Tungsten–aluminum–titanium alloys
See Aluminum–titanium–tungsten alloys.

Tungsten borides
cermets preparation with Fe, Ni, and Co, 11: 6716(J)

Tungsten carbide–cobalt systems
See Cobalt–tungsten carbide systems.

Tungsten carbides
bonding to steel, 11: 2476
corrosion in Redox Process solutions, 11: 8453
friction and wear properties, 11: 13153
recrystallization and rest at elevated annealing temperatures, x-ray analysis, 11: 1067(J)
wear resistance as bearing materials in ThO_2 slurry pumps, 11: 8900

Tungsten carbonyls
preparation and properties, 11: 1011(J)

Tungsten–chromium–titanium alloys
See Chromium–titanium–tungsten alloys.

Tungsten coatings
on bearing surfaces and valve trim, carbidization, 11: 11573(R)
on Inconel, for carburization studies, 11: 4880(R)

Tungsten dioxides
See Tungsten oxides.

Tungsten electrodes
characteristics of d-c arcs with Ti anodes in inert gases, 11: 334
comparison of thoriated, zirconiated, and pure, for welding, 11: 4897(J)

Tungsten fluorides
thermodynamic properties, 11: 3721(R)

Tungsten isotopes
neutron inelastic scattering at 2.6 Mev, energy levels, 11: 10772

Tungsten isotopes W^{181}
decay schemes, 11: 600(J), 3603(J)
isomeric state, 11: 5551(J)

Tungsten isotopes W^{182}
energy levels, 11: 13445(J)
energy levels, precision determination of, 11: 12868(J)
gamma-γ angular correlation, 11: 773(J)
radiation emission, 11: 1272

Tungsten isotopes W^{183}
energy levels, precision determination of, 11: 12868(J)
rotational bonds, 11: 1304(J)

Tungsten isotopes W^{184}
energy levels, precision determination of, 11: 12868(J)

Tungsten isotopes W^{185}
beta spectra, calorimetric determination of energy, 11: 12940(J)
decay, 11: 12294(J)
decay properties, 11: 4171(J), 8226(J)
decay schemes, 11: 6866(R)

Tungsten isotopes W^{186}
energy levels, precision determination of, 11: 12868(J)
neutron cross sections, 11: 11740(R)

Tungsten isotopes W^{187}
backscattering correction procedure test on, 11: 1690(J)
decay properties, 11: 8226(J)
decay schemes, 11: 6866(R)

Tungsten–nickel alloys
See Nickel–tungsten alloys.

Tungsten oxides
crystallization, 11: 8117(R)

Tungsten steel
corrosion by liquid Na, 11: 3398
neutron reactions (n,γ), 11: 13209

Tungsten–tantalum–uranium alloys
See Tantalum–tungsten–uranium alloys.

Tungsten–titanium alloys
See Titanium–tungsten alloys.

Tungsten–titanium carbide systems
See Titanium carbide–tungsten systems.

Tungsten–uranium alloys
gravimetric analysis for U and W, 11: 9997

Tungsten–zirconium alloys
adsorptive properties for ions in aqueous solutions, 11: 9869(R)

Tungstic acid
solubility in UO_2SO_4, 11: 7858(R)

Turbidimeters
See Nephelometers.

Turbidimetric analysis
See Nephelometry.

Turbine blades
temperatures and stresses in hollow, for gas turbines, 11: 12008(J)

Turbine pumps
See Centrifugal pumps.

Turbines
(See also Blowers; Compressors; Gas turbine engines; Turbojet engines.)
benzene cycle, thermodynamic investigation, 11: 1041
comparative performance of turbine generator sets, 11: 1028
cooling, effectiveness of wire cloth walls, 11: 11163
design of closed-cycle, for nuclear power plants, 11: 2127(J), 5600(J)
power removal from reactors using steam, optimum conditions, 11: 5587
test procedure for HRT, 11: 8644
turbo alternating at Calder Hall, 11: 665(J)

Turbojet engines
designs and materials for high-speed, high-temperature shaft seals, 11: 6321
pressure loss in cannular J-73 combustor, 11: 13354
radiation effects, procedures for determining, 11: 2181

Turbulent flow
See Fluid flow (turbulent); Gas flow (turbulent).

Turmeric
analytical uses for B determination in atmosphere, 11: 11080

25 Process
(Recovery and decontamination of U^{235}, by solvent extraction and conversion to UNH, from depleted fuel elements from various reactors.)
application to HRE fuel solutions, 11: 7502
capital and operating cost of plants for, 11: 7743
caustic dissolver solution, removal of UO_2 particles from, 11: 12363
corrosion of 347 stainless steel by first cycle raffinate, 11: 7478
corrosion of types 347 and 309 SCb stainless steels by simulated waste solutions of, at various temperatures, 11: 7612
cost estimates, 11: 198(J)

25 Process (cont'd)

critical mass control, effect of safe geometries and safe batches, 11: 13664

criticality studies, 11: 11827

decontamination, effect of first cycle scrub ratio reduction on, 11: 7531

decontamination achieved with MTR assemblies vs. cooling time, 11: 11611

development, 11: 12991

development studies, 11: 12392(R)

dissolution of Al alloy slugs in, 11: 7552

dissolver condenser design, 11: 8337

equipment, 11: 7479

equipment-maintenance manuals, 11: 2297

feed adjustment, use of dibasic aluminum nitrate for, 11: 13000

feed preparation, metal solution, and solvent extraction, first cycle, 11: 11613

filtration of solutions in, investigation of MnO_2 effectiveness for, 11: 9656

fission burnup of enriched U^{235} used in verification of, 11: 8332

flowsheet modifications in, 11: 8346

flowsheets, pulse column performance, and solvent extraction, 11: 7530

fuel element dissolution, 11: 8353

manuals, plants, and equipment, 11: 2343

material balance for MTR elements, 11: 11601

metal solution, first cycle solvent extraction, and raffinate processing, 11: 8352(R)

metal solution, in-line instrumentation, 11: 457

off-gas composition for MTR, 11: 2344

off-gas system for, pressure drop through, 11: 7477

pilot plants and equipment, 11: 13002

process description and flowsheets, 11: 12362

product purity and evaporator corrosion, 11: 8378

pulse column performance and Al dissolution, 11: 7503(R)

solvent radiation damage and Al dissolution, 11: 7504(R)

uranium recovery using TBP as solvent, 11: 9660

23 Process

(Recovery and decontamination of U^{233} from neutron-bombarded thorium by solvent extraction.)

comparison of batch and continuous operation, 11: 9653

extraction equipment and process efficiency, 11: 8340(R)

flowsheet alterations in, for fuel with 2% Zr, 11: 13580(R)

flowsheets, 11: 12393(R), 13019(R)

isolation, process efficiency, and solvents, 11: 8341(R)

isolation of U^{233} from irradiated slugs using TBP, 11: 12989(R)

laboratory scale studies, 11: 9654

metal solution, 11: 7484(R)

pilot plant, results of 10 hot runs, 11: 7554

pilot plants, orientation manual, 11: 9658

recovery of Pa^{233} in, 11: 12393(R)

recovery of U^{233} from Th and fission products by diisopropyl ether, 11: 8391

solvent-extraction flowsheet and U^{233} concentration by ion exchange, 11: 8394

Tyndallmeters
See Nephelometers.

Tyuyamunites

mineralogy and occurrence in Mayoworth Area Wyo., 11: 3830(J)

U

UAP Process

(Recovery of uranium from Hanford metal waste by precipitation of uranyl ammonium phosphate, and conversion to UF_6.)

pilot plant continuous operation, 11: 12439

pilot plant for recovery of Hanford waste metals, 11: 13017(R)

uranium loss in recycle recovery, 11: 7552

Ulcers

radioinduced skin, ligature application, 11: 3663(J)

Ultracentrifugation
See Centrifugation.

Ultrasonic inspection
See Sonic inspection.

Ultrasonics

application of, 11: 5889(R)

application of, to cold welding of metals, 11: 11207

application to decontamination of reactor tubes, 11: 11915

application to dissolution and metallurgy, 11: 10111(R)

application to nondestructive testing, 11: 11173(J)

degassing of Al and Al–Mg by, 11: 3857(J)

dissolution of stainless steel and Zircaloy-2, 11: 8943(R)

feasibility of application to liquid-liquid extraction, 11: 9256

furnace and transducer-coupler-punch systems, 11: 7197

scanner and recording system, 11: 5412(J)

Ultraviolet radiation

effects on activity of sperm in mouse, 11: 9935(J)

effects on chromosome abberrations in Tradescantia, 11: 8775(J)

effects on vitamins, 11: 8861(J)

inactivation of E. coli B. by exposure to, 11: 11030(J)

sensitivity of bacteriophages to, 11: 9912

yeast mutants induced by exposure to, 11: 7911

Ultraviolet sources

design of hydrogen arc lamp for, 11: 7368(J)

Ultraviolet spectroscopy

design of spectrometer for study of light emission in gases, 11: 1274(R)

hematological determination of x-radiation effects using, 11: 29(J)

improvements on spectrometer, 11: 7292(R)

Underground bursts (atomic)
See Atomic explosions.

Underwater bursts (atomic)
See Atomic explosions.

UNH
See Uranyl nitrates.

UNH Conversion Process

calcination equipment for conversion of UNH to UO_3, 11: 11999

flowsheets, 11: 8417

preparation of UO_3 by spray calcining, 11: 8408

Union Carbide Nuclear Co. Y-12 Plant, Oak Ridge, Tenn.

accident reports on Zr explosion, 11: 12059

Union Pacific Deposits (Colo.)

mineralogy, wall-rock control, and ore occurrence in, 11: 1118(J)

United Kingdom Atomic Energy Authority. Research Group. Atomic Energy Research Establishment, Harwell, Berks, England

report lists, Jan. 1952 to Dec. 1955, 11: 9187

report lists, sale items and published papers, 11: 8760

United States

geologic investigations of radioactive deposits in, 11: 6357(R), 10084(R)

University of Southern Calif., Los Angeles

progress reports on boron hydrides, 11: 3368(R)

progress reports on transport processes in liquid systems, 11: 7088(R)

UPR

See Uranium Production Reactor.

Uramildiacetic acid

chelation with inorganic ions, chemical factors and industrial applications, 11: 917(J)

Uraninites

(See also Pitchblendes.)

catalytic oxidation in carbonate leach slurries, 11: 1021

concentration in U ores, evaluation of methods for, 11: 8871(R)

discovery as an additional mineral in granite by nuclear photographic emulsion technique, 11: 286(J)

Uranium

absorptiometric determination in Butex Process solutions, 11: 4281

absorptiometric determination in solutions by an improved thiocyanate method, 11: 11093(J)

absorption from ion exchange resins, 11: 2325(R)

absorption of H and N at various temperatures, 11: 7658(R)

absorption of hydrogen by, 11: 4390, 7659(R)

absorption of trace amounts in human body following ingestion in food and drink, 11: 1759(J)

acid etching, 11: 12490(R)

acid leaching from low-grade ores, 11: 7016(P)

activation determination in Al, 11: 13266

activation determination in U ores, 11: 5778

activity release, effect of H_2O erosion, 11: 13759

adsorption by char-in-pulp process, 11: 6683

adsorption from solutions, 11: 2322

adsorption from 10% Na_2CO_3 solution, effect of Amberlite IRA-400 on, 11: 2327(R)

adsorption on charcoal from acid solutions, 11: 2364

adsorption on clay minerals, 11: 1489

adsorption on stainless steel, 11: 14041

aerosols, preparation, 11: 1771(J)

alloy properties, 11: 12486

alpha, coefficients of thermal expansion, 11: 1388(J)

analysis, casting, electrodeposition, and purification, 11: 7568(R)

analysis, production, and recovery, bibliography, 11: 2226

analysis for boron, 11: 940(J)

analysis for carbon, 11: 11564(R)

analysis for C by induction heating, 11: 9589(R)

analysis for C by taking up CO_2 in $Ba(OH)_2$ and titrating, 11: 12971(R)

analysis for H, minutes of meeting on, 11: 7643

Uranium (cont'd)

analysis for hydrogen in alpha-, 11: 10503(J)

analysis for Np^{239}, counting efficiency of various instruments in, 11: 8844(J)

analysis for O_2 and N_2 content, 11: 12349

analysis for plutonium in Redox Process, 11: 13671

analysis for Th, 11: 9590(R)

analysis for trace impurities, 11: 1772

analysis of ANL high-purity, chemical and spectrographic results of, 11: 7894

analysis of extruded, for H_2, 11: 8484(R)

analysis of high-burnup, 11: 11406

annealing, 11: 6991, 13221(R), 13788(R)

annealing, effects on hardness and structure, 11: 11657(R)

annealing in helium and argon atmospheres, 11: 7576

apparatus for hydrofluorination and fluorination under glovebox conditions, 11: 3355(J)

arc melting and continuous casting, 11: 10843

atmospheric contamination in melt plants, 11: 2241

atomic structure of metallic, 11: 2883(J)

autoradiographic determination in radioactive minerals, 11: 944(J)

bibliographies of Princeton Group research on, 11: 2371

bibliographies of solvent extraction processes, 11: 6695

bonding to Al, 11: 13794(R)

bonding to Sn–Zr alloys, 11: 13775

bonding to Zr and U–Nb alloy cans, 11: 7673(R)

bonding to Zr cans, 11: 11702(R)

burnup in power reactors, cost aspects, 11: 3550

carcinogenicity, 11: 1392

casting, 11: 7665(R), 8487(R), 8525(R), 9636, 13040, 13041

casting, metallurgical properties, and pyrophoricity tests, 11: 8755

casting, use of metal molds, 11: 13699

casting, vacuum apparatus, 11: 7017(P)

casting, vacuum furnace for, 11: 8529

casting and melting, 11: 10887(R)

casting and melting, effect of furnace pressures on quality of remelted, 11: 7581

casting at 1295°C, 11: 13582(R)

casting by "lost wax" techniques, 11: 8752

casting in Cu molds, 11: 7656(R)

casting in graphite crucibles, 11: 8489, 9746, 11687(R), 13703

casting in heated molds, 11: 8526, 8527

casting in Zr sleeves, 11: 13794(R)

casting of, process of coating graphite molds used in, 11: 13693

casting of EBR blanket components of, 11: 7720

casting on Nb–U alloys, 11: 11703(R)

casting techniques, 11: 13784(R)

casting techniques, in thin-walled molds, 11: 10736(R)

casting voids and resulting defects, 11: 10894

ceramic coatings of BeF, Si, Cr, and Zr, 11: 13088

chain transmutation, computation concerning conditions for, 11: 9488(J), 9489(J)

chelation with di(salicylal) alkylene diimines, separation from rare earths, 11: 5095(P)

chemical analysis and isotopic abundance, 11: 215

Uranium (cont'd)

chemical analysis for N_2, 11: 10810(R)

chemical and mechanical properties, 11: 13782(R)

chemical determination in uranium(III) fluorides, 11: 9600

chemical properties, 11: 2551

chemical reactions with graphite, 11: 7734(R)

chemical reactions with N_2 and O_2 at elevated temperatures, 11: 7576

chemical reactions with steam, 11: 10498

chemical reactions with H_2O, effect of H formed and metal lost, 11: 2253

chemical separation from daughters for γ spectrometric determination of U^{235}, 11: 14040

chemistry in Bismuth Phosphate Process, 11: 7515(R)

chemistry of aqueous solutions, 11: 12339(R)

chlorination, recovery from ores by, 11: 7410

cladding for high-temperature service, 11: 12524

cladding with Al, 11: 11703(R), 13777

cladding with Zircaloy II, 11: 7681(R)

cladding with Zr, 11: 13837(R)

cladding with Zr, iodide decomposition process for, 11: 13084

cladding with Zr by extrusion, 11: 8516(R)

cladding with zirconium by roll bonding, 11: 11687(R)

classification of stringers and identification of inclusions in reactor grade, 11: 8468

cleaning and pickling, 11: 8414

cleaning chips of, laboratory survey of deoxidants for, 11: 8415

coating, 11: 12405(R)

coating, development of barrier coat materials, 11: 8463

coating, electroplating, forging, and rolling, 11: 11709

coating, preparation of shell molds for, 11: 8519(R)

coating, rolling, corrosion, and polarographic determination, 11: 10812(R)

coating by dip and electroplating, 11: 13784(R)

coating in Mg bath containing Ni, Si, or Zr, diffusion, 11: 7673(R)

coating with Al and Ni, 11: 7657(R)

coating with Cr and Nb, diffusion, 11: 11702(R)

coating with Mo, 11: 13789(R)

coating with Ni, 11: 13777

coating with nickel, cost factors for, 11: 2688

coating with Ni and Si, 11: 7656(R)

coating with Si, diffusion, 11: 7626(R)

coating with Zn and Cu–Mg, 11: 11704(R)

coating with Zr by electrolysis, 11: 11504(P)

coating with Zr by metal-arc spraying in inert atmospheres, 11: 13076

coatings on, testing, 11: 8450(R)

coefficients of friction between, on U, 11: 10092

cold drawing limited by cupping, 11: 9737(R)

cold-rolled and recrystallized textures in, effects of temperature and rate of reduction, 11: 10895

colorimetric analysis for Al, 11: 12352(R)

colorimetric analysis for Ni, 11: 7429(R)

colorimetric and potentiometric determination, 11: 2826

colorimetric determination by thiocyanate method, 11: 10815(R)

colorimetric determination in ores by dibenzoylmethane, 11: 4297(J)

Uranium (cont'd)

colorimetric determination in uranium alloys, 11: 4302(J)

colorimetric determination in U ores, 11: 4295(J)

colorimetric determination in vanadium solutions, 11: 4368(J)

concentration of 23-Process solutions by ion exchange, 11: 8394

concentration with screening and waste hydrochloric acid, 11: 13594

concurrent extraction with TBP, effect of controlled saturation on the organic phase, 11: 2398

continuous U^{233} recovery from irradiated ThF_4, 11: 12987

corrosion, 11: 7708(R)

corrosion, fabrication, and mechanical properties, 11: 11656(R)

corrosion, literature survey, 11: 9715

corrosion and diffusion coating, 11: 11688(R)

corrosion and ductility, 11: 13042

corrosion by biphenyl, 11: 2898

corrosion by boiling water, effects of added C on, 11: 7903

corrosion by boiling water, effects of metal purity and heat treatment on, 11: 7893

corrosion by distilled water, 11: 7666(R)

corrosion by high-temperature water and LiOH solutions and hydridation, 11: 10872

corrosion by liquid Na, 11: 11745(R)

corrosion by moist He, effects of impurity content and rolling on, 11: 2484

corrosion by moist He, effects of rolling and annealing on, 11: 2485

corrosion by molten Al–Si eutectic, 11: 7673(R)

corrosion by HNO_3, 11: 7663(R)

corrosion by NaCl solutions, 11: 7663(R)

corrosion by water, 11: 7663(R), 8450(R), 9711(R), 10811(R)

corrosion by water, effects of corrosion inhibitors and temperatures, 11: 7655(R)

corrosion by water, effects of deuteron irradiation on, 11: 8737

corrosion of Zn dip-coated, by boiling distilled H_2O, 11: 7673(R)

corrosion studies, 11: 13782(R)

corrosive effects on Al_2O_3 and Ta, 11: 7408(R)

Coulomb excitation, 11: 573(J)

creep and mechanical properties, mathematical analysis, 11: 10798

creep flow and rate of swell of gas bubbles in irradiated, 11: 10047

creep of α, during neutron irradiation, 11: 1389(J)

critical volume determination, 11: 2139(J)

criticality, 11: 7577

criticality calculations for spheres, 11: 2770

criticality studies of diluted oralloy (~90% U^{235}), 11: 11489

cross section measurement, effect of radiation, 11: 3543

cross sections, 11: 13197(R)

crystal structure, 11: 13564(R)

crystal structure, mechanical properties, phase studies, and transformation temperatures, 11: 9325(R)

crystal structure and heat treatment, 11: 1877(R)

cube, microstructure, 11: 13582(R)

cutting and machining, 11: 12468

decontamination, 11: 11618

decontamination by CTF Process, 11: 8379

decontamination by fluoride volatility, 11: 12374

decontamination by high-temperature processes, 11: 7543(R), 8388(R)

decontamination by liquid metal and fused fluoride extractions, distillation, and oxide scavenging, 11: 7542(R)

Uranium (cont'd)

decontamination of, by segregation in the melt, by electrorefining, and by electrolytic fluorination, 11: 13580(R)

decontamination with fused salts, 11: 8386(R)

decontamination with fused UF_4, 11: 8387(R)

density and microstructure of arc melted and cast, 11: 10843

density decrease from irradiation, 11: 10901

determination, polarographic, 11: 13599(R)

determination, procedures for, 11: 1

determination by continuous ether extraction, 11: 13578(R)

determination by ether solvent extraction, apparatus for, 11: 8324

determination by gamma spectroscopy, 11: 4312(J)

determination in accessory minerals, method of, 11: 3776(J)

determination in air at KAPL, 11: 10804

determination in Al-clad U–Al alloy, 11: 8523

determination in Bi, 11: 12214(R)

determination in Bi–U alloys, 11: 11095(J)

determination in $Br-BrF_3-UF_4$ mixtures, 11: 7441

determination in burned or brequet compressed samples, 11: 9275(J)

determination in low-grade ores with β counter, 11: 13603

determination in minerals, rocks, and ores by bead test, 11: 4288

determination in ores, 11: 2839(J), 9275(J)

determination in ores and U solutions by ion exchange, 11: 4293(J)

determination in ores and water, 11: 12002(J)

determination in phosphate ore solutions, fluorimetric, volumetric, and spectrophotometric, 11: 930

determination in process streams, automatic analyzer for, 11: 2840(J)

determination in Purex Process streams, 11: 11585

determination in sea and river waters, 11: 3343(J)

determination in tails, cakes, and process solutions, 11: 1772

determination in Thorex Process streams, 11: 3697

determination in 25 Process solutions, 11: 11601

determination in V–U mixtures, 11: 2262

determination methods, development, 11: 8282(R)

determination of trace amounts in beef tissues, 11: 1434(J)

determination of trace amounts in biological materials, 11: 1433(J)

determination of U/O atomic ratio in uranium oxides, 11: 105

deuteron attenuation at 320 Mev, 11: 8567

deuteron bombardment, production of Pu^{236} and Pu^{238} from, 11: 13202

deuteron inelastic scattering cross sections at 190 Mev, 11: 8735(R)

deuteron reactions, 11: 13197(R), 13837(R)

deuteron reactions, deuteron cross sections, and fission, 11: 9886(R)

deuteron reactions, neutron yields from, 11: 4709(J)

deuteron reactions (d,n), 11: 8724, 8735(R), 9778

deuteron reactions (d,n), angular distribution, 11: 14020(R)

deuteron reactions (d,n), neutron yield calculations, 11: 8723

deuteron reactions (d,n) and proton reactions (p,n), 11: 8722

diffusibility for Pu, 11: 12483

diffusion in Al, effect of temperature, 11: 13922

diffusion in Cu, Mo, and Zr, 11: 8679(R)

diffusion of Al in, 11: 10497

diffusion of fission neutrons through, 11: 10228

diffusion of Kr and Xe in, 11: 10585

Uranium (cont'd)

diffusion of xenon isotopes Xe^{133} from, in temperatures 570 to 1000°C, 11: 5953(J)

dimensional stability, 11: 7709(R), 8687(R), 12575(R), 13197(R), 13221(R), 13789(R)

dimensional stability, effects of added C on, radiation and thermal cycling effects, 11: 7903

dimensional stability, effects of radiation on, 11: 10047

dimensional stability, under thermal cycling, 11: 8686(R), 13763(R)

dimensional stability of, rolled and recrystallized at 300 to 600°C, effects of irradiation and thermal cycling on, 11: 13561

dimensional stability of thermal cycled hollow and powder metallurgy slugs, 11: 7847(R)

dimensional stability on thermal cycling and irradiation, effects of preferred orientation and grain size on, 11: 7892

dissolution by bromine fluorides, 11: 8265(R), 13579(R), 13581(R), 13633(R)

dissolution by BrF_3, reaction kinetics, 11: 7407(R)

dissolution by $HNO_3-Hg(NO_3)_2$, 11: 11567(R)

dissolution in Fluoride Volatility Process, effects of temperature, solution composition, and flow rate on, 11: 11968

dissolution in fused fluoride baths, 11: 11052

dissolution in HCl, 11: 11744(R)

dissolution in Hg, 11: 13647(R)

distribution coefficients in butyl phosphate–kerosene systems at low acid concentrations, 11: 212

distribution in impregnated graphite, 11: 12427

distribution in liquid metal–fused salt systems, 11: 7734(R)

distribution in SIR cooling system after fuel pin failure, 11: 12564

economic aspects of natural vs. enriched, for reactor fuels, 11: 11445(J)

effective cross sections of various enrichments, 11: 12508(R)

electroplating with Ni and Ag, 11: 11745(R)

elastic constants for rolled bars of, at 25 and 300°C using ultrasonic pulses, 11: 11009

elastic scattering of 2.62-Mev γ rays, 11: 3186(J)

electric and thermal conductivity, 11: 8687(R)

electric conductivity, effects of phase transition, orientation in polycrystals, heat treatment, hydrostatic pressure, and tensile properties on, 11: 8246

electrodeposition for isotopic analysis, 11: 2256

electrodeposition of microgram and submicrogram quantities, 11: 4314(J)

electrodialytic separation from complex mixtures, 11: 987

electrolytic dissolution of, 11: 13580(R), 13696

electrolytic polishing, 11: 6991

electrolytic recovery from fused UCl_3, 11: 5093(P)

electrolytic recovery from HCl solution containing Fe, Cr, Ni, and Cu, 11: 5089(P)

electrolytic recovery from oxalate solution, cell design, 11: 5084(P)

electrolytic recovery from oxalate solution containing Ni, Fe, Cr, and Cu, 11: 5083(P)

electrolytic reduction and precipitation from a nitrate system, 11: 7493

electrolytic separation from fused salt melts, 11: 9254

electron energy levels and nuclear spin, 11: 1289

electron energy levels in α, calculation, 11: 6581

electron energy states, 11: 8942(R)

electroplating, techniques for, 11: 8485(R), 13221(R)

electroplating with Al, 11: 7635

electroplating with Ni, 11: 8466

Uranium (cont'd)

electroplating with Ni and Mo, 11: 8486

elution from loaded amberlite resin with H_2SO_4, 11: 4365

elution from TRA-400 resin, 11: 994

enamel coatings for, 11: 13782(R)

energy band structure calculations, thermal conductivity, electrical resistivity, and zone melting, 11: 7889(R)

energy band structure of metallic phases, 11: 6770

enriched, fabrication of slug elements from, 11: 13791

entrainment of solvent in recovery from heavy slurries, 11: 183

equipment and techniques for irradiating, in Na, 11: 9607

etching and grain structure of cast bars, 11: 10496

etching by ionic bombardment, 11: 11703(R)

etching of, by ionic bombardment, 11: 13794(R)

etching reagent testing, 11: 13784(R)

exchange reactions of UO_2^{2+} and U^{4+} in hydrochloric acid solutions, 11: 13576(R)

explosions from reaction with cutting oil, 11: 2814

explosive reactions with H_2O at high temperatures, 11: 2511

extraction, closed-cycle process for, 11: 12408

extraction and purification by ion exchange, 11: 6299(J)

extraction as soluble carbonate from ammonium salts, 11: 1816(R)

extraction from acid leaching of Cu–U ore, 11: 7538(R)

extraction from acid solutions with monazite, 11: 7537(R)

extraction from carnotites, effect of cold dilute-acid leach, 11: 2390

extraction from ores, industrial aspects, 11: 998(J)

extraction from pitchblende–HNO_3 slurry, 11: 11629(R)

extraction from U and V ores by Resin-in-Pulp Process, 11: 12705

extrusion, 11: 7656(R), 8517(R), 13221(R), 13788(R), 13803

extrusion, between 550 and 800°C, 11: 7645

extrusion, impact, 11: 12478

extrusion and hot piercing, 11: 7649

extrusion and metallography, 11: 7657(R)

extrusion cladding with Sn–Zr alloy, 11: 8517(R)

extrusion of α, 11: 8516(R)

extrusion of billets, 11: 8484(R)

extrusion of tubes, 11: 7646(R)

fabrication, 11: 7654(R), 12486, 13803

fabrication for Calder Hall Reactors, 11: 9118(J)

fabrication for EBR breeding elements, 11: 10922

fabrication of depleted, 11: 8500

fabrication of enriched wire samples for reactor radiation exposure, 11: 7688

fabrication of fuel plates for fast exponential experiment, 11: 7626(R)

fabrication of parts by hot pressing, 11: 7685

fabrication of spheres by powder metallurgy, 11: 12482

fabrication plant for, capital and operating costs for, 11: 7743

fabrication practices used in ISC foundry, 11: 10883

fast fission factor, 11: 592, 2636

fast fission in rods of natural, 11: 9898

fatigue resistance of α-rolled, 11: 13795

fiber textures, correction factor for quantitative determination, 11: 359(J)

field determination of trace amounts in natural waters, method for, 11: 5290(J)

Uranium (cont'd)

fireproofing wood for containers, 11: 2419

fission, 11: 14018

fission accompanied by three fast particles, 11: 8247(J)

fission and capture, effect of d,p bombardment, 11: 13039

fission by 140 to 660 Mev protons, analysis of light charged particles in, 11: 12958(J)

fission by 340-Mev protons, 11: 2254(R)

fission of, studied by photographic emulsions, 11: 4767(J)

fission product β activity, estimation, 11: 1493

fission product distribution from, 11: 13838(R)

fission product gas removal by charged wire technique, 11: 11599

fission ratio determination of U^{233} and U^{238}, 11: 11744(R)

fluorimetric analyzer for, 11: 13270(J)

fluorimetric and volumetric determination, 11: 10815(R)

fluorimetric determination, 11: 934(J), 5782, 13564(R)

fluorimetric determination, use of trialkyl phosphine oxides in, 11: 1430

fluorination, mathematical analysis, 11: 8423

fluorination by single step process, 11: 7575

fluorination of, by BrF_3 in Fluoride Volatility Process, 11: 11968

fluorination to produce UF_4, 11: 10502

fluorination with BrF_3, 11: 12420

fluorination with liquid ClF_3, 11: 10846

forging, 11: 9732, 13803

gamma emission of, use for estimating amount of U^{235} in fuel material, 11: 2608

gamma-transmission determination in Al–U alloys, 11: 13605

gasometric analysis for H_2, N_2, and O_2, 11: 3339

gasometric analysis for O_2, 11: 13578(R)

geochemical prospecting, use of leachable U in, 11: 12736(J)

geochemistry in Baltic Sea Basin, 11: 4869(J)

geology, geochemistry, mineralogy, and occurrence, 11: 6312(J)

grain growth, microstructure, grain boundries, 11: 2228(J)

grain growth characteristics and phase transformations of hot-pressed, 11: 11011

grain structure and deformation mechanisms, effects of thermal cycling on, 11: 2222, 13058

gravimetric determination of, in UF_6, 11: 8295, 13695

gravimetric determination in U–W alloys, 11: 3997

gravimetric determination of Cl in, 11: 2400

gravimetric determination using TBP, 11: 12344

gravimetric determination using $(NH_4)_2S_2O_3$ and $NaH_2PO_2 \cdot H_2O$, 11: 5795(J)

grinding coolants, corrosive effects, 11: 13053

growth and dimensional stability of α-rolled, contained in Zr, effect of irradiation on, 11: 13223

growth of U hydride inclusion in grain boundary, 11: 3416

growth of UAl_3 layers on, during dip coating with Al, 11: 10497

growth rate, effects of radiation on, 11: 7626(R)

Hall coefficient as function of temperature, 11: 8942(R)

Hall effect, measurement of, 11: 11495(J)

hardness, 11: 321(R)

hardness decreased by increased annealing, 11: 9737(R)

hardness tests, 11: 7658(R)

hazards during handling contaminated copper and stainless steel scrap, 11: 12658(J)

Uranium (cont'd)

heat of vaporization and vapor pressure, 11: 9579(R)

heat transfer to cooling water, 11: 2771

heat treatment, 11: 7666(R)

heat treatment, development of hydrogen excluding salt bath for, 11: 12317(R)

high-temperature corrosion by water, 11: 6718

high-temperature effects on, 11: 8547(R)

high-temperature reactions with steam, 11: 10499

high-temperature separation from fission products, 11: 10829(R)

high-temperature separation from Th and Mg–Th alloys, 11: 4454(R)

hot-pressed, physical properties, 11: 7685

hot-pressing, equipment and procedures for, 11: 12434

hot-pressing in high α-temperature range, 11: 7895

hydrogen concentration in, 11: 13788

hydrogen content, effects of annealing practice on, 11: 12480

hydrogen occlusion in beta heat treatments, 11: 8504

inclusions, identification and counting, 11: 3428

inclusions, metallographic study of, 11: 13099, 13808

inclusions and cracks, design and performance of an electromagnetic instrument for detection, 11: 10893

inelastic scattering of neutrons, 11: 816(J), 6009(J)

interaction with ceramic oxides, 11: 12716

interfaces, behavior during recrystallization, 11: 2228(J)

internal and surface defects, 11: 7579

internal conversion coefficients for K shell, 11: 4653(J)

internal defects, control, 11: 13025

internal defects, non-destructive testing for, 11: 11713

internal defects in dingot tubes, 11: 12317(R)

internal friction and crystal structure, effects of stress and temperature on, 11: 811

internal friction in rolled bars of, effect of heat treatment, 11: 11010

ion exchange, 11: 8283(R), 8338(R), 9257, 9676(R), 10481

ion exchange, effect of Fe and phosphate on, 11: 994

ion exchange, fission fragment analysis, 11: 3702

ion exchange, precipitation from H_3PO_4, sorption from solutions, dissolution from resins, 11: 2324(R)

ion exchange extraction of Marysvale and Sunshine ore solutions, 11: 7538(R)

ion exchange from acid and carbonate leach solutions, 11: 4367

ion exchange from acid leach solutions, 11: 2928(J)

ion exchange from acid phosphate solutions, 11: 2315(R)

ion exchange from leached zone material, 11: 182

ion exchange from Midnight Mine ore leach solutions, 11: 4366

ion exchange from nitrate solutions, 11: 9587(R)

ion exchange from phosphoric acid and sulfuric acid solutions, 11: 2363(R)

ion exchange from H_3PO_4 solution, 11: 2325(R), 11578(R)

ion exchange from sulfuric acid solutions, 11: 2314

ion exchange of, in separation process waste, 11: 9629(R)

ion exchange of uranyl ions on Dowex-50, 11: 5276(J)

ion exchange on sulfonic acid resins, 11: 2318(R)

ion exchange recovery, 11: 1018(R), 2321, 5265, 6296

ion exchange recovery from MgF_2 scrap, 11: 12418

Uranium (cont'd)

ion exchange separation from fission products with phosphate resins, 11: 4360

ion exchange separation from leach solutions, 11: 2350

ion exchange separation from Th in HNO_3 solutions, 11: 4372

irradiated, abrasive cutting, 11: 8503

isotope effect in spectra of uranyl compounds, 11: 11826

isotope fractionation factor in batch equilibration between resin and versene solutions, 11: 7498

isotopic analysis, a comparison of methods, 11: 2385, 10506(J)

krypton diffusion from, effect of thermal cycling, 11: 1218(J)

lattice parameters, temperature dependence on, 11: 4454(R)

leaching from sulfidic materials, 11: 7394(P)

leaching with Na_2CO_3 for extraction from metal hydroxides, 11: 2394

liquid metal cooling, equipment for investigating, 11: 8517(R)

liquid metal extraction, 11: 8390(R), 12490(R)

liquid metal extraction from Th and solubility in Th–Mg and Mg, 11: 11978

liquid metal extraction of fission products from, 11: 7544(R), 10428(R)

localization of, in lamellae of the alloy, 11: 2229(J)

machining, 11: 7577, 7658(R)

machining characteristics, 11: 13784(R)

machining procedures for, 11: 3063

mass spectrographic analysis of enriched, 11: 13834(R)

mass-yield curve for fission of natural, by 14-Mev neutrons, 11: 12955(J)

maximum temperature for wafers under irradiation, calculation of, 11: 13028

mechanical properties, changes in, during burnup, 11: 764(J)

mechanical properties, effects of annealing media on, 11: 12481

mechanical properties of dingot tubes, 11: 12317(R)

mechanical properties of polycrystalline, 11: 11687(R)

mechanical properties of pre-irradiated, 11: 9899

melting, 11: 8525(R)

melting, casting, internal defects identification, 11: 10887(R)

melting and casting, application of vibrational energy to, 11: 9750, 13095(R)

melting and casting, large-batch, 11: 11651

melting and casting without contamination, 11: 9542(P)

melting on zirconia, urania, and magnesia, 11: 13582(R)

melting point and transformation temperatures of high-purity by thermal analysis, 11: 7626(R)

metallographic techniques, 11: 3428, 8484(R)

metallography of H in, 11: 7643

metallography of irradiated, 11: 2223

metallurgical properties, 11: 13784(R)

metallurgical research conference, 11: 8522

metallurgical studies of, progress, 11: 10691(R)

metallurgy, 11: 683(J), 8519(R)

microscopic examination techniques, 11: 11141(J), 11494(J)

microstructure, 11: 13221(R)

microstructure, effects of liquation, induction melting, and alloying additions on, 11: 13025

microstructure of, examination by formation of epitaxial layer of oxide, 11: 11142(J)

microstructure in the γ phase temperature range, 11: 13803

Uranium (cont'd)
microstructure of thermal cycled, 11: 13058
mining, health hazards from radon and radon daughters, 11: 1753(J)
mining, use of radioisotopes in health hazard study, protection, 11: 56(J)
molten salt extraction, 11: 7145(R), 8390(R)
multiple fission studies using Cl^{38}, 11: 12330(R)
neutron absorption, 11: 7842(R)
neutron activation determination, 11: 8285(R)
neutron activation determination of U^{235}, 11: 6258(R)
neutron angular distribution and yield from deuteron bombarded, 11: 13838(R)
neutron capture and fission events in thick targets bombarded by 190-Mev deuterons, 11: 14020(R)
neutron capture-to-fission ratio, 11: 682(J)
neutron cross section changes in NRX irradiated, 11: 4764
neutron cross sections, 11: 11739(R)
neutron diffusion in a solid block, equations for, 11: 9903
neutron economy, effect of Be primary target on, 11: 13039
neutron emission, 11: 13197(R)
neutron flux distribution, 11: 7630(R)
neutron irradiation of reactor fuels of, buildup of heavy isotopes during, 11: 4213
neutron production by deuteron bombardment, 11: 10996(R)
neutron production by deuterons from NaK and H_2O cooled Zr-clad, 11: 13826
neutron production by electron bombardment, 11: 3093(J)
neutron production in targets of, when bombarded by high-energy protons and deuterons, 11: 8729
neutron resonance absorption, geometry effects, 11: 3631(J)
neutron resonance absorption in lumps, 11: 11348
neutron resonance capture probability by a slug in the Hanford Production Reactor, 11: 2681
neutron resonance cross sections, 11: 7842(R)
neutron resonance escape probability and effective resonance integral, 11: 1616
neutron resonances, 11: 8562(R)
neutron scattering cross sections, 11: 8562(R)
neutron spectra from target of, bombarded with 190 Mev deuterons, 11: 8566
neutron yield from spontaneous fission, 11: 4572(J)
neutron yields from proton and deuteron bombardment of, 11: 13828
neutrons from fission induced in, by 147-Mev protons, 11: 3098(J)
nonaqueous extraction from U ores, 11: 977
nonaqueous separation from fuels by hydriding and hydrochlorination, 11: 12402
nuclear processes, effect of size of target, 11: 13039
nuclear reactions with fast neutrons, calculation of constants, 11: 9072(J)
occurrence and methods of prospecting, 11: 299(J)
occurrence in accessory allanite of igneous rocks, 11: 9291(J)
occurrence in Bavaria, 11: 10086(J)
occurrence in black shale deposits of Northern Rocky Mountains and Northern Great Plains, 11: 3409(J)
occurrence in Mg fluoride slag, 11: 1825
occurrence in phosphate deposits of U.S., bibliography, 11: 11190
occurrence in Texas, 11: 1087(J)
occurrence of short-lived I isotopes in natural and depleted, 11: 12956(J)

Uranium (cont'd)
organic precipitants and complexing agents for, 11: 2312, 2321
organic precipitants for, 11: 2305(R)
oxidation, 11: 7708(R)
oxidation, volumetric determination of, apparatus for, 11: 13582(R)
oxidation by molecular O_2 in $HClO_4$, 11: 217(J)
oxidation by O_2 at various temperatures, 11: 13582(R)
oxidation by steam to UO_2, 11: 11808(R)
oxidation in argon containing traces of O_2, 11: 9268
oxidation in carbonate leach solutions, evaluation of oxidants for, 11: 11980
oxidation of, temperature effects on, 11: 9580(R), 10842
paper chromatographic separation with 2-methyltetrahydrofuran, 11: 7558
paramagnetic susceptibilities, 11: 1914(J)
permissible limits, revisions in computation, 11: 2234
permissible limits in air, 11: 10806
phase studies, 11: 12486
photometric determination in oxides, 11: 11583
photoneutron yields, 11: 4130(J)
physical metallurgy, bibliography on, 11: 5703
physical properties of low- and high-C, 11: 8470
physical properties of pre-irradiated, 11: 9899
pilot plant studies of solvent extraction processes for, 11: 7675
plastic deformation in polycrystalline, 11: 4766(J)
plastic deformation in thermal cycling, 11: 10802(J)
plastic flow and swelling of gas bubbles, radiation effects on, 11: 3373
poisoning, mechanisms, 11: 56(J)
polarographic–amperometric analysis for V, 11: 9234(J)
polarographic analyses, sensitivity by use of multiple dropping electrodes, 11: 8380(R)
polarographic analysis of process solutions, 11: 1429(R)
polarographic determination as dihydroxymaleate complex, 11: 1839(J)
polarographic determination in aqueous and organic solvent solutions, 11: 10500
polarographic determination in dissolver solutions, 11: 8285(R)
polarographic determination in solutions containing Fe^{3+}, 11: 924
polarographic determination of microgram quantities following single solvent extraction from rocks and natural waters, 11: 112(J)
polygonization substructures, mechanism of formation in α, 11: 10504(J)
porosity, effect of inclusions on, 11: 13058
potentiometric determination by $Fe_2(SO_4)_3$ method, 11: 10815(R)
powder metallurgy, 11: 9745(R), 13516(J)
powder metallurgy, bar production by, 11: 8532
precipitated from UO_2CO_3, requirement of NaOH in, 11: 10827
precipitation, 11: 3761, 9744
precipitation, use of anthragallol, 8-quinolinol, arsanilic acid, aurintricarboxylic acid, and benzopurpurin as precipitating agents, 11: 2277
precipitation and electrolytic separation from carbonate leach solutions, 11: 13293
precipitation as NH_4^+ salt, 11: 13698(R)
precipitation by long-chain amines and arsonic acids, 11: 2312
precipitation by organic reagents, 11: 2313(R), 2314, 2315(R)
precipitation from acid leach liquors, 11: 2315(R), 2348
precipitation from carbonate leach solutions, 11: 2316(R), 2317(R), 2323, 9531(P)

Uranium (cont'd)

precipitation from leach solutions, 11: 996, 2302, 5266

precipitation from leach solutions, effect of neutralization on, 11: 2396

precipitation from organic extracts, 11: 8864

precipitation from phosphoric acid solution, 11: 2325(R)

precipitation from sulfate and phosphate solutions, 11: 2319(R), 2321

precipitation from sulfuric acid solutions with amines and organic compounds of P and As, 11: 2318(R)

preferred orientation in, after rolling at 600°C, 11: 9748

preferred orientation in, extruded at 500°C, 11: 4770(J)

preferred orientation in, techniques for determining, 11: 12498

preferred orientation in rod, 11: 12456(R)

preferred orientation in rolled and β-treated, 11: 7626(R)

preferred orientation in rolled bars, 11: 13098

preferred orientation in rolled rods, rapid method for determining, 11: 8416

preferred orientation in 300°C rolled and in recrystallized sheet, 11: 7624

preparation, 11: 12486

preparation by reduction of U oxides, 11: 11703(R)

preparation of, by hot pressing UH_3, 11: 12429(R)

preparation of spherical particles, 11: 9739

processing, cost analysis, 11: 6890

processing, health-physics instrumentation for, 11: 215

processing costs from crude ores to enriched form, 11: 224(J)

production, evaluation of refractories for use in bomb reduction of UF_4, 11: 7600

production, improved ion exchange process for, 11: 11984(J)

production, method of tapping reduction bomb, 11: 9543(P)

production and applications, 11: 7(J)

production and casting, 11: 9694

production and free world's reserves, 11: 9121(J)

production and recovery, 11: 12405(R)

production and recovery, electrolytic reduction process for, 11: 7968

production by bomb reduction of U oxide, 11: 10854

production by Ca or Mg reduction of the halides and oxides, 11: 1588(R)

production by electroseparation from oxides, 11: 7383

production by Mg reduction of UF_4, 11: 7587, 7654(R), 9537(P), 9544(P)

production by magnesium reduction of UF_4, effects of Mg quality on, 11: 7565

production by Metal Hydrides Inc., 11: 8751

production by reduction of halides, crucible linings for, 11: 11521(P)

production by reduction of UF_4, effects of excess Mg on, 11: 7564

production by UF_4 reduction in refractory lined crucibles, 11: 9713

production from raw salts, flow sheet, 11: 6313(J)

production in Canada, 11: 10085(J)

production in S. Africa, 11: 9909(J)

production in TBP Process, continuous γ monitor for analytical control, 11: 11737

production of enriched, by reduction of UF_4, pilot plant standard operating procedure for, 11: 10844

production of high purity, 11: 13763(R)

production of high-purity, by iodide volatility process, 11: 7011(P)

production of metal cubes from $UO_2(NO_3)_2$ solutions, 11: 2368(R)

properties, effects of alloying elements on, 11: 11695

Uranium (cont'd)

properties and structure, 11: 10811(R)

prospecting for, handbook, 11: 12046(J)

prospecting for, survey, 11: 283

prospecting in satellite countries of Soviet Union, 11: 12038(J)

protective coating studies, 11: 11746(R)

proton bombardment at 147 Mev, number of neutrons emitted during, 11: 4706

proton fission and spallation, 11: 2741

proton fission at 480 Mev, cross sections and distribution curves, 11: 1279(J)

proton reactions, neutron yield from, 11: 1278(R)

proton reactions, (p,n), 11: 8724, 13197(R)

pulse column extraction from waste solutions, 11: 11640

purification by drossing, 11: 7144(R)

purification by ion exchange and solvent extraction, 11: 13634

purification by liquid-metal extraction, 11: 2871(J)

purification by zone melting, behavior of Ru during, 11: 4446

purification from its fission products by fractionation of metal fluorides, 11: 7476

purification of, by melting in refractory oxide crucibles, 11: 10841

purification of, by zone melting, 11: 13580(R)

purification to spectrographic-grade product, 11: 13001

purity and Ra content, 11: 11629(R)

pyrochemical processing for fuel recovery and fission product decontamination, 11: 13680(R)

pyrochemical transfer of Pu from spent to fresh, 11: 7547

pyrometallurgical processing, 11: 7548(R), 10820(R)

pyrophoricity, 11: 2934(J), 9581(R)

quality control of ingots, 11: 10813(R)

quantitative determination by radiometric and fluorimetric methods, 11: 223(J)

radiation damage, reduction by Zr alloying, 11: 8319

radiation effects, 11: 764(J), 5668(J), 13516(J), 13627, 13724

radiation effects in $\alpha-\beta$ range, 11: 7629(R)

radiation effects on, effects of fabrication variables on, 11: 8462(R)

radiation effects on electrical resistance, 11: 7902

radiation effects on reaction with Na, 11: 14029

radiation effects on reactivity, 11: 11744(R)

radiochemical prospecting, 11: 1872(J)

radiometric analysis for U^{234} and U^{238}, 11: 11659

radiometric analysis for U^{235}, 11: 10813(R)

radiometric determination in precipitated phosphatic materials, 11: 2276

radiometric determination in process solutions, 11: 1023

radiometric determination in urine samples, 11: 5779

radiometric determination of body burden in uranium mill workers, 11: 4251(J)

raffinate processing, 11: 9676(R)

reaction kinetics of, with BrF_3, 11: 13580(R)

reaction with Co at 1200°C, 11: 7660(R)

reaction with Ga, 11: 8461

reaction with graphite, 11: 13885(R)

reaction with organic solvent N_2O_4 mixtures, 11: 1025(J)

reaction with trichloroethylene in degreasing, 11: 8407

Uranium (cont'd)

reactions produced by electrical explosion of, immersed in fluids, 11: 9753

reactivity changes in NRX irradiated, 11: 5018

reclamation of scrap by a cutting, degreasing, washing, briquetting procedure, 11: 7007(P)

recovery, 11: 9676(R), 11618

recovery, and separation of B from, 11: 7559

recovery, by reduction of UF_4, behavior of Ru and P during, 11: 12438

recovery, effect of particle size of phosphate rock on, 11: 5258

recovery, effects of associated elements on, 11: 2323

recovery, flowsheets for, 11: 1809

recovery, processing of uraniferous slags for, 11: 1812(R)

recovery and decontamination by solvent extraction with pentaether, 11: 2304

recovery and purification by continuous ion exchange and electrolysis, 11: 9673

recovery and reuse from calutrons by spray washing, 11: 2583

recovery as by-product of brown oxide process, 11: 9616

recovery as crystalline UO_4 from aqueous solutions of Mg, H_2SO_4, CaF_2, and Fe, 11: 3239(P)

recovery by carbonate leaching from Mg fluoride scrap and wastes and sulfate residues, 11: 1825

recovery by fixed-screen resin-in-pulp process, 11: 11595

recovery by precipitation and solvent extraction, 11: 2308(R), 2861

recovery by solvent extraction and H precipitation from soda ash solutions, 11: 1809

recovery from acid anion exchange resin eluate containing $NaUO_2^{2+}$ and Cl^-, 11: 3230(P)

recovery from acid leach solutions by reduction to U^{4+} and phosphate precipitation, 11: 6999(P)

recovery from acid phosphate solutions, 11: 3221(P)

recovery from acid press-cake, 11: 12381

recovery from acid raffinate using ion exchange, and phosphorylated cotton cloth, 11: 11629(R)

recovery from adsorbents, 11: 11798(R)

recovery from aqueous phosphates, 11: 11500(P)

recovery from aqueous solutions containing F^- by complexing F^- with Al, 11: 6998(P)

recovery from Bartow clay and Marysvale ores, 11: 2363(R)

recovery from Br_2–BrF_3 mixtures, 11: 8386(R)

recovery from by-product scrap materials, processes for, 11: 12382

recovery from calutron receivers, 11: 3244(P)

recovery from calutron wash solutions, 11: 3243(P), 3245(P), 11505(P)

recovery from calutron wash solutions by electrolysis, 11: 7003(P)

recovery from carbonate leach residues, 11: 1479(R), 1480(R), 1481(R), 1485(R)

recovery from carbonate leach solutions using strong-base quaternary amine anion exchange resin, 11: 6994(P)

recovery from carbonate residues, 11: 9692(R)

recovery from carnotite ores and purification by phosphate precipitation, 11: 11508(P)

recovery from carnotite ores by salt-roast carbonate-leach process, ratio of V to U as a factor in, 11: 10857

recovery from carnotites, 11: 2309, 2310(R)

recovery from cellulose pulp column with acetone and ethyl ether, 11: 1493

recovery from Chattanooga Shale, 11: 3760

Uranium (cont'd)

recovery from cleaning solutions at the Gaseous Diffusion Plant, 11: 5288(J)

recovery from collector pocket of calutron by electrodeposition, 11: 3220(P)

recovery from dilute aqueous solutions by solvent extraction, 11: 7000(P)

recovery from dilute solutions by aromatic phosphoacids or arsenoacids, 11: 3224(P)

recovery from domestic shales, 11: 2320

recovery from enriched reactor fuel, 11: 13582(R)

recovery from Fiberglas air filters, 11: 2377

recovery from Florida leached zone materials by flotation, 11: 976(R)

recovery from fuel elements, 11: 13647(R)

recovery from fused halides by electrolysis, 11: 7002(P)

recovery from Au wastes, methods of, 11: 2879(J)

recovery from graphite shapes following electrolytic disintegration, 11: 12398

recovery from Hanford and ORNL wastes, development of TBP Process for, 11: 9655

recovery from Hanford waste metal sludge rates, 11: 7580

recovery from high-lime carnotite ores, 11: 2363(R)

recovery from high-U concentrates, 11: 12380

recovery from hydroxide residues by H_2SO_4 digestion and precipitation, 11: 7004(P)

recovery from ignited B salvage residues, 11: 2375

recovery from La Sal ore, 11: 1022

recovery from leach liquors by amine extraction process, 11: 12706

recovery from leach solutions by ion exchange and precipitation, 11: 3363

recovery from Pb gangue, 11: 9630(R)

recovery from lignite and lignite ash, 11: 2355(R)

recovery from magnesium fluoride slag from feed materials production, 11: 5267(J)

recovery from MgF_2 slags, 11: 11564(R)

recovery from MgF_2 slags by fluoride volatility, 11: 13655

recovery from Mallinckrodt residues, 11: 13035

recovery from monazite sands by solvent extraction methods, 11: 8325

recovery from monazites, 11: 7469, 8326(R), 8328(R), 8329(R), 8330(R), 11598

recovery from monazites by caustic leaching, 11: 8327(R)

recovery from monazites by precipitation, 11: 11625

recovery from oil shale, 11: 12410(R)

recovery from ore by resin-in-pulp process, 11: 6300(J)

recovery from ore concentrates, 11: 12415

recovery from ore concentrates by smelting process, 11: 7015(P)

recovery from ore leach solutions by solvent extraction, 11: 11655(R)

recovery from ores, concentrates, residues, and products by leaching, 11: 13015

recovery from ores and concentrates by flotation process, 11: 7192(R), 10479(R)

recovery from ores and metal production, 11: 203(J)

recovery from ores by HCl leaching and acetone extraction, 11: 11517(P)

recovery from ores by leaching with SO_2 in aqueous Fe^{3+} or Mn, 11: 5706

recovery from ores by solvent extraction and ion exchange, 11: 9627(R)

recovery from ORNL salvage material, 11: 7492

Uranium (cont'd)
recovery from phosphate or phosphoric acid solutions by ion exchange, 11: 3238(P)
recovery from phosphate rock, 11: 5821(J), 8250(P), 9535(P)
recovery from phosphate rock leach liquor by precipitation with long-chain amidines, 11: 11512(P)
recovery from phosphate washer slimes, 11: 2307
recovery from phosphates, 11: 2326(R)
recovery from phosphoric acid by precipitation with KOH and $Ca(OH)_2$, 11: 2391
recovery from pitchblende by acid leaching, 11: 8385
recovery from pitchblendes, 11: 12376(R)
recovery from plateau ores, 11: 981
recovery from pregnant eluate by solvent extraction, 11: 4365
recovery from process waste, 11: 9629(R)
recovery from Purex wastes, 11: 13007(R)
recovery from raw materials, bibliography on, 11: 992
recovery from reactor fuels by ion exchange, 11: 12391
recovery from recycled MgF_2 wastes by acid extraction, 11: 10813(R)
recovery from residues containing uranyl salts, 11: 13688
recovery from saline solutions by biological slimes, 11: 3374(J)
recovery from scrap, 11: 9632(R)
recovery from shales, 11: 2382
recovery from slag by ion exchange, 11: 11612
recovery from slags, 11: 9691(R), 13038
recovery from slags, bronze flux, and uraniferous residues, 11: 12394(R)
recovery from slags, flowsheets, 11: 9700
recovery from solid waste, 11: 9628(R)
recovery from spent fuel element by dissolution in a fluoride melt, 11: 4392
recovery from spent homogeneous reactor fuel, survey, 11: 11603
recovery from stainless steel calutron collector, 11: 5090(P), 9538(P)
recovery from sulfuric leach solutions by precipitation as $U_3(PO_4)_4$, 11: 2404
recovery from uraniferous residues, 11: 1484(R), 1486(R), 1813(R) 1817(R), 1818(R), 1819(R), 1820(R), 1821(R)
recovery from uraniferous slags, 11: 1478(R), 1482(R), 1483(R)
recovery from uraniferous slags and alloys, 11: 1814(R), 1815(R)
recovery from U–Zr alloys, 11: 8424
recovery from U–Zr and U–Al alloys, 11: 11744(R)
recovery from UO_2–MgO mixtures, 11: 8386(R)
recovery from UO_2 process residues, 11: 9614
recovery from wash solutions containing Fe, Cr, Ni, and Cu, 11: 5096(P)
recovery from waste and preparation of cubes containing F, 11: 8421
recovery from waste material, 11: 7388(P)
recovery from waste materials by uranate precipitation, 11: 1494(J)
recovery of microgram quantities, 11: 4314(J)
recovery of Ru from solutions of irradiated, 11: 9539(P)
as reducing agent for water reduction, 11: 5759
reduction, flowsheets for, 11: 8410
reduction in Na_2CO_3 solutions, 11: 2312
refining, 11: 10051(J)
refining by melting and liquation, 11: 13025
refining by straining molten, 11: 3250(P)
Uranium (cont'd)
refining in fused $BaCl_2$–KHF bath at 1200°C, 11: 3226(P)
refractories for melting and casting, 11: 4859(J)
remelting and casting of, yields from, 11: 7679
removal from effluent water by use of tannic acid and lime, 11: 10033
removal from reactor using steam and H_2 then HNO_3, 11: 5117(P)
resistance roll cladding, 11: 7626(R)
resonance absorption of neutrons by cylinders, 11: 4769(J)
resonance integral, 11: 682(J)
roll cladding, optimum temperatures for, 11: 8715(R)
roll cladding with Al, 11: 8466
rolling, 11: 9732, 11005, 13788
rolling, oxidation loss during, 11: 13804(R)
rolling, safety considerations for, 11: 2225
rolling, "sine phi" corrections in, 11: 8475
rolling after preheating, 11: 7671
rolling into rods and metallography of rolled rods, 11: 12971(R)
rolling of rods, 11: 13763(R)
rolling temperature, effect on preferred orientation, 11: 6734
scaling tests in H_2O at 593 to 760°C, 11: 7660(R)
scattering cross sections, proton, deuteron, He^3, and α, 11: 10996(R)
scattering of fast electrons, 11: 756(J)
separation and determination by a Fluoride Volatility Process, 11: 8426
separation and determination of small amounts in fission-product mixtures, 11: 164(R)
separation by electrolytic reduction and pH control, description and Cr interference, 11: 2358
separation from alloys by hydridation and dissolution, 11: 7008(P), 7018(P)
separation from Al and Fe by ion exchange in nitrate media, 11: 11982(J)
separation from americium in HNO_3 solutions, 11: 4358
separation from Anaconda acid, 11: 12385(R)
separation from bismuth by thioacetamide precipitation, 11: 5820(J)
separation from boron, 11: 3235(P)
separation from CaO by solvent extraction, 11: 10854
separation from carnotites by acid leaching and phosphate precipitation, 11: 2360
separation from Ce and Eu by organic coprecipitation, 11: 9265(J)
separation from cladding, 11: 8520(R)
separation from fission products, 11: 13288
separation from fission products by drossing with UO_3, 11: 5260
separation from fission products by fluoride volatility process, 11: 5269(J)
separation from fission products by solvent extraction, volatility, and pyrometallurgical methods, 11: 5263(J)
separation from fission products with Ag and La, 11: 4810(R)
separation from Fe by $(NH_4)_2CO_3$ method, test for, 11: 8264
separation from leach solutions by solvent extraction, 11: 8880(J)
separation from ores and purification, 11: 6316(J)
separation from Pa, by solvent extraction, 11: 9534(P)
separation from Pu, coprecipitation with phosphates, 11: 11514(P), 11515(P), 11516(P)
separation from Pu and fission products, 11: 7545(R), 8867
separation from plutonium by ion exchange, 11: 5271(J)
separation from Pu by volatilization, 11: 7541

Uranium (cont'd)
separation from Pu using molten Mg, 11: 7973(J)
separation from plutonium using U–Sn phase separation, 11: 5094(P)
separation from rare earths, effect of Na_2CO_2 leaching on, 11: 2327(R)
separation from rare earths by ion exchange, 11: 9262(J)
separation from rare earths by solvent extraction with TBP, 11: 9261(J)
separation from Te, 11: 13577(R)
separation from Th, Bi, and ores with tributyl phosphate, 11: 10038(J)
separation from thorium, rare earths, and iron by complexing with KF or NH_4F, 11: 6315(J)
separation from Th and Pa, 11: 11493
separation from thorium and protactinium by TBP extraction from HCl solutions, 11: 4370
separation from Th by anion exchange, 11: 7571(R)
separation from thorium by ion exchange, 11: 2327(R)
separation from Th by ion exchange in acid solutions, 11: 7468
separation from thorium in uranium ores by Amine Extraction Process, 11: 3362(R)
separation from Th–U–Pa mixtures by cation exchange, 11: 13576(R)
separation from V and Fe, 11: 9274(J)
separation from vanadium by ion exchange, 11: 4368(J)
separation processes for irradiated fuels, 11: 6314(J)
SF materials accounting, 11: 7577
SF materials accounting and quality control at Y-12 (ORNL), 11: 215
shotgun analysis, 11: 12351
slugs, non-destructive testing, 11: 11714
sodium carbonate stripping from leach liquors, 11: 2860(R)
solder bonding Al sheet to, 11: 12471
solubility in bismuth, 11: 2140(J), 2933(J), 7734(R), 13965
solubility in caustic dissolver solution, 11: 11607(R)
solubility in Pb, 11: 8931(J)
solubility in Pb and Pb–Bi alloys, 11: 7733(R)
solubility in liquid metals, 11: 7681(R)
solubility in liquid metals, liquid metal extraction, 11: 2857
solubility in Mg–Th eutectic alloy, 11: 4454(R), 11703(R)
solubility in orthophosphoric acid, 11: 11574(R)
solubility in sodium, calcium, and magnesium bicarbonate solutions, 11: 6356(R)
solubility in Th, 11: 10088
solubility of metals in, 11: 4464(R)
solubility of Zr in, 11: 8462(R)
solvent extraction, 11: 2356, 3758(R), 3759, 5270(J), 9676(R), 7470(R), 8873, 9662, 11647(R), 11969(R), 12385(R), 12970(R), 13019(R), 13633(R), 13698(R)
solvent extraction, bibliographies, 11: 6695
solvent extraction and precipitation by organic reagents, 11: 2311(R)
solvent extraction by Amex and Dapex processes, 11: 3359(R), 7090(R), 10475(R)
solvent extraction by amines, 11: 186(R), 975, 5256(R)
solvent extraction by diethyl ether, 11: 7471(R)
solvent extraction by ether from AAA pitchblende ores, 11: 9650
solvent extraction by hexone, 11: 8380(R)
solvent extraction by isopropyl ether, 11: 7539(R)
solvent extraction by organo-phosphorus compounds, 11: 9663
solvent extraction by synergistic combinations of phosphorus compounds, 11: 10036(R)

Uranium (cont'd)
solvent extraction by TBP, 11: 7560
solvent extraction by TBP–kerosene solution, 11: 1477
solvent extraction by TBP Process, 11: 2339
solvent extraction by TBP in pulse columns, 11: 13003
solvent extraction chemistry, 11: 11600
solvent extraction from acid leach solutions, 11: 176, 2357, 2858
solvent extraction from acid leach solutions with amines, 11: 214, 2336
solvent extraction from aqueous nitrate, sulfate, phosphate, and fluoride solutions, 11: 11647(R)
solvent extraction from carbonate leach solutions, 11: 991
solvent extraction from carnotite sludges, 11: 9613
solvent extraction from carnotites with octyl phosphoric and octyl pyrophosphoric acids, 11: 4842(R)
solvent extraction from chloride solution and decontamination, 11: 13581(R)
solvent extraction from feed slurries with TBP, 11: 8393
solvent extraction from irradiated Th, 11: 6997(P), 8357(R), 11493
solvent extraction from leach solutions, 11: 1824(R), 2856(R), 7145(R), 9628(R)
solvent extraction from leach solutions and reduction, 11: 982(R)
solvent extraction from leach solutions with alkyl phosphoric acids, 11: 1823(R), 3361(R)
solvent extraction from metal wastes by TBP, 11: 12399
solvent extraction from monazite, 11: 7675
solvent extraction from monazite leach solutions, 11: 7428(R)
solvent extraction from nitric acid–aluminum nitrate solutions, 11: 4363(R)
solvent extraction from nitric acid solutions with ether, equipment design for, 11: 4309(J)
solvent extraction from HNO_3 solutions with TBP, 11: 7571(R)
solvent extraction from ORNL metal wastes by Purex Process, 11: 12401
solvent extraction from ORNL waste solutions, process for, 11: 12387
solvent extraction from ore leach and process solutions, 11: 3367(J)
solvent extraction from ore leach solutions with amines, 11: 4361(R)
solvent extraction from ore solutions in Mallinckrodt Process, 11: 11570
solvent extraction from H_3PO_4, extractants used, 11: 7970
solvent extraction from phosphoric acid with OPPA, 11: 7142(R)
solvent extraction from process solutions, 11: 7472(R), 7473(R), 7474(R)
solvent extraction from sulfuric acid slime slurry, cost factors, 11: 978
solvent extraction from Th, 11: 8326(R)
solvent extraction from U ores, 11: 13290
solvent extraction from waste solutions, 11: 11641
solvent extraction from wet process phosphoric acid, 11: 2854
solvent extraction in a rotary extractor, 11: 5251
solvent extraction in liquid-liquid annulus columns, 11: 6230
solvent extraction in the pentaether process, 11: 13023
solvent extraction in the presence of complexing agents, 11: 2313(R)
solvent extraction in pulse columns, effects of temperature on, 11: 8375
solvent extraction in Purex Process, 11: 11604
solvent extraction in Thorex Process, 11: 11606(R)
solvent extraction of UO_2^{+2} from ore leach solutions, 11: 2363(R)
solvent leaching processes for extraction from ores, 11: 13031

Uranium (cont'd)

solvent partition and decontamination, 11: 10823

solvent partition between hexone and $HNO_3-Ca(NO_3)_2$ solutions, 11: 6685(J)

solvent partition in acetylacetone, 11: 11123

solvent properties for carbides, 11: 13788(R)

spallation and fission, 11: 4116

spectra, analysis of complex, 11: 205(J)

spectrographic analysis, mixing vs. shaking in addition of Ga_2O_3 to U_3O_8 in, 11: 10810(R)

spectrographic analysis for B, 11: 10814(R)

spectrographic analysis for rare earths, 11: 8404, 12352(R), 12971(R)

spectrographic analysis for U^{235}, 11: 2824

spectrographic determination in Hermex process, 11: 13648(R)

spectrophotometric analysis for Ca, 11: 932

spectrophotometric analysis for Th, 11: 4289, 9590(R)

spectrophotometric determination, 11: 2262

spectrophotometric determination in ores and leach liquors, 11: 6260(J)

spectrophotometric determination in organo phosphates, 11: 10815(R)

spectrophotometric determination in Nb–U alloys, 11: 8842(J)

spectrophotometric determination in solutions of sulfates and carbonates, 11: 2832

spectrophotometric determination in $UO_2(NO_3)_2$ solutions, 11: 185(R)

spectrophotometric determination of micro quantities, 11: 6659(J)

spectrophotometric determination of milligram quantities, 11: 1427

spectrophotometric determination using thoronol, 11: 4829(J)

spectrophotometric determination with ammonium thiocyanate, 11: 2829

spectrophotometric determination with 8-quinolinol, 11: 10038(J)

spontaneous neutron yield of natural, 11: 7382

statistical analysis of impurities in, 11: 11718

storage, corrosion by moisture during, 11: 10811(R)

storage recommendations, 11: 4761

stress-strain characteristics, 11: 5334, 6991

stripping from TBP using aqueous citrate solutions, 11: 11613

stripping from tri-n-octylamine in kerosene using MgO, 11: 10036(R)

structure and properties of α-extruded, 11: 8515(R)

structure and properties of cold-rolled, 11: 8515(R)

structure of α-rolled β-heat treated slugs, 11: 13969(R)

superconductivity, 11: 8246

surface alloying of, with corrosion-resistant coatings, 11: 8405

surface beta activity of ingots, 11: 4391

surface defects in rolled rods of, effects of chemical impurities on, 11: 7642

swaging, 11: 6991

temperature coefficient of reactivity, 11: 6100(J)

temperature distribution equations, 11: 12631

temperature distribution and thermal stresses in, 11: 8483

temperatures for various specimen radii, 11: 2771

tensile and compression tests, ductility, mechanical strength, and rolling, 11: 7627

tensile properties, 11: 6991, 7654(R)

tensile properties, effects of H_2 content on, 11: 12480

tensile properties from 25 to 800°C, 11: 8502

tensile properties of heat treated, 11: 7663(R)

Uranium (cont'd)

thermal conductivity, 11: 7155, 7662(R), 8686(R), 8688(R), 11702(R)

thermal conductivity of materials bearing, 11: 8548(R)

thermal conductivity to 500°C, equipment for measuring, 11: 7630(R)

thermal cycling, 11: 13837(R)

thermal cycling and dimensional stability, 11: 8688(R)

thermal cycling effects, 11: 4455

thermal cycling of, jacketed in Ta, 11: 8462(R)

thermal cycling stability, effects of Al, Mo, Nb, Si, Ti, and V on, 11: 7896

thermal cycling through transformation temperatures, 11: 7677(R)

thermal expansion coefficients between 25 to 100°C, 11: 10802(J)

thermal expansion of rolled, 11: 13598(R)

thermal fission, neutron multiplication factor, 11: 590(J)

thermal neutron capture cross sections, 11: 9443

thermal properties, 11: 7455(R), 7654(R)

thermal ratchet theory of dimensional instability in, 11: 8513

thermal stresses in long cylindrical rods, 11: 8757

tissue distribution and excretion in man, 11: 8815

tissue distribution following injection in man, dogs, and rats, 11: 52(R)

tolerance of, survey, 11: 12313

U^{235} content of natural, 11: 8427

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

vacuum fusion extraction apparatus, 11: 1520

vapor-deposited coatings of Cr, Mo, Nb, and Zr and corrosion of, 11: 13776

vapor deposition of Nb, Mo, and Zr on, 11: 11702(R)

vapor pressure, 11: 7455(R)

variation of η in reactors of slightly enriched, 11: 10918

volatilization and liquid metal and molten salt extractions from irradiated U and Th–U alloys, 11: 7546(R)

volumetric and spectrophotometric determination in Pt–U alloys, 11: 3341

volumetric determination, 11: 7455(R)

volumetric determination in stainless steel, 11: 12345

volumetric determination in stainless steel–UO_2 plates, 11: 8296(R)

volumetric determination in UF_4, 11: 7589

volumetric determination in uranyl selenites, 11: 201(J)

volumetric determination of U^{3+} in fused fluoride salts, 11: 12974

volumetric determination using ceric sulfate and ferroin, effect of interfering ions, 11: 12350

volumetric determination using $Ti_2(SO_4)_3$ as reductant before oxidimetric titration, 11: 7952(J)

welding, 11: 12470

wire, fabrication, 11: 11829

x-ray diffraction after surface treatments, 11: 13582(R)

x-ray photometric determination in HNO_3, 11: 4821

x-ray spectrometric determination in process solutions, 11: 1426

x-ray transition, 11: 3217

zinc base dip coating, 11: 7673(R)

zone melting, separation from fission products by, 11: 6182(J)

zone melting for fission product removal, 11: 13807

Uranium (Al clad)

brazing of Al spacing fins to flat-plate fuel elements of, 11: 11694

Uranium (Al clad) (cont'd)
buckling, effect on reactivity, 11: 2116(R)
corrosion by pile effluent water, 11: 8451(R)
corrosion of solder-bonded joints in, 11: 12471
dissolution process manual, 11: 7566
measurement of Al-coating thickness, instrument for, 11: 13049
nondestructive measurement of Al thickness, 11: 8465
sonic inspection of bonding, 11: 12448
testing, 11: 7659(R)
thermal cycling, 11: 13794(R)
transformation and nonbond ultrasonic tester for, design and performance, 11: 7698
Uranium (Be clad)
fabrication, 11: 13095(R)
Uranium (clad)
fabrication of Cu jacketed, 11: 13790(R)
resonance absorption of neutrons in cylinders, 11: 10335(J)
stabilization, relation to jacket thickness, 11: 7628
Uranium (liquid)
corrosive effects on carbides, 11: 7677(R)
corrosive effects on Ta and metallic carbides, 11: 7676(R)
crucible for handling, 11: 3225(P)
decontamination by scavenging with solid U oxide, carbide, and nitride, 11: 8389
distribution of Pu and fission products between molten U and UF_3-BaCl_2 mixtures, 11: 6308(J)
high-temperature reactions with H_2O, 11: 3834(R)
interaction with graphite at 1150 to 1400°C, 11: 9269
oxidation of, by solid oxidants, 11: 10841
separation of Mo and Zr from, with Ag, 11: 8512(R)
solvent properties for H between 100 and 1208°C, 11: 7660(R)
Uranium (Ni clad)
corrosion by water, 11: 8485(R)
nondestructive measurement of Ni thickness, 11: 8465
preparation and corrosion resistance, 11: 7655(R)
Uranium (Si clad)
corrosion resistance, 11: 7655(R)
Uranium (stainless steel clad)
radiation damage in, 11: 7626(R)
spot welding feasibility, 11: 7651
stabilization, relation to jacket thickness, 11: 7628
Uranium (U clad)
fabrication, for reactor fuel plates, 11: 12470
Uranium (Zr clad)
corrosion by 600°F pressurized water, 11: 4860
corrosion by steam and air, 11: 10923(R)
corrosion by water, 11: 13778
dissolution, 11: 11643, 13197(R)
extrusion, 11: 7650, 7681(R)
extrusion, cladding of small-diameter rods, and thermal cycling, 11: 8518(R)
fabrication, 11: 11744(R)
fabrication of reactor fuel plates, 11: 7623
preparation, 11: 13778
preparation by extrusion, 11: 12317(R)
Uranium (Zr clad) (cont'd)
radiation targets of, thermal stress calculations, 11: 7879
stabilization, relation to jacket thickness, 11: 7628
temperature distribution and thermal stresses in, 11: 8483
temperatures in Zr core radii, 11: 2771
thermal stress analysis of, spherical fuel elements, 11: 8482
Uranium alcoholates
preparation and properties, 11: 1495(J)
preparation and properties of penta-n-, 11: 11144(J)
reactions with Na, Ca, and Al ethoxides, 11: 1496(J)
Uranium alloy compacts
radiation effects, 11: 11105
Uranium alloys
analysis for Th, 11: 13608
atomic displacement in solid solutions, theory, 11: 4765
casting, 11: 12954
cladding with Zircaloy II, 11: 7681(R)
colorimetric analysis for U, 11: 4302(J)
contamination by crucible materials, 11: 9581(R)
corrosion, 11: 13824
corrosion, literature survey, 11: 9715
corrosion and radiation effects, 11: 13869(R)
corrosion by biphenyl, 11: 2898
corrosion by boiling water, 11: 7665(R), 8405
corrosion by distilled water, 11: 7666(R)
corrosion by high-temperature H_2O, 11: 11748(R)
corrosion by 260°C water, 11: 13870(R)
corrosion by H_2O, 11: 8716(R), 11674, 11746(R)
corrosion resistance, improvement by addition of Mo and Si, 11: 6589(P)
corrosion resistance, use of Mo to improve, 11: 6588(P)
corrosive effects on Al_2O_3, 11: 7408(R)
creep strength at 1500 to 1800°F, 11: 12630
dimensional stability, 11: 8687(R), 13824
dimensional stability, effects of alloying elements and heat treatment on, 11: 8406
dimensional stability of, by thermal cycling, 11: 8686(R)
dimensional stability of slugs, 11: 13968(R)
fabrication and melting of binary, with Mo, Nb, and Si, 11: 13516(J)
hardness and fabrication, 11: 8406
inclusions, metallography, 11: 13099
interaction with ceramic oxides, 11: 12716
low melting, phase studies, temperature effects, and metallography of, for cast fuel elements, 11: 8471
mechanical properties, 11: 13824
mechanical properties, changes in, during burnup, 11: 764(J)
mechanical properties, effect of constitution diagrams on, 11: 6580
metallurgical research conference, 11: 8522
metallurgy, 11: 683(J), 12608(R)
phase studies, 11: 8495(R), 11688(R), 12954
phase studies in Mo-U, Cu-U, Mg-U, and Sn-U, 11: 13787(R)
preferred orientation in thermal cycled, of Al, Si, Ti, and V, 11: 13763(R)
preparation, 11: 12954
preparation of dimensionally stable, 11: 9545(P)

Uranium alloys (cont'd)
preparation of spherical particles of, 11: 13785
production bibliography, 11: 2226
radiation effects, 11: 13516(J)
recovery of U by hydridation and dissolution, 11: 7018(P)
resistivity, 11: 12608(R)
sample preparation and analysis, 11: 8386(R)
solubility in Bi–Pb eutectic, preparation, 11: 13790(R)
surface radioactivity due to thorium, 11: 4391
tensile properties, 11: 7665(R)
tensile properties, improvement by addition of Mo and Si, 11: 6589(P)
thermal cycling, 11: 7846(R)
thermal cycling effects, 11: 11687(R)
thermal cycling of "fissium," 11: 13870(R)
thermal cycling stability, 11: 7896
thermal cycling through transformation temperature, 11: 7677(R)
uranium recovery by hydridation and dissolution in HCl, 11: 7008(P)
Van de Graaff radiography, 11: 2772
x-ray emission analysis for Mo and Ru, 11: 7408(R)
zone melting, 11: 7626(R)
zone melting for fission product removal, 11: 13807

Uranium–aluminum alloy couples
See Aluminum alloy–uranium couples.

Uranium–aluminum alloys
See Aluminum–uranium alloys.

Uranium–aluminum alloys (Al clad)
See Aluminum–uranium alloys (Al clad).

Uranium–aluminum alloys (liquid)
See Aluminum–uranium alloys (liquid).

Uranium–aluminum–boron systems
See Aluminum–boron–uranium systems.

Uranium–aluminum compacts
See Aluminum–uranium compacts.

Uranium–aluminum couples
See Aluminum–uranium couples.

Uranium–aluminum–magnesium alloys
See Aluminum–magnesium–uranium alloys.

Uranium–aluminum oxide compacts
See Aluminum oxide–uranium compacts.

Uranium–aluminum–silicon systems
See Aluminum–silicon–uranium systems.

Uranium–beryllium alloys
See Beryllium–uranium alloys.

Uranium–beryllium compacts
See Beryllium–uranium compacts.

Uranium–beryllium–zirconium alloys
See Beryllium–uranium–zirconium alloys.

Uranium–bismuth alloy slurries
See Bismuth alloy–uranium slurries.

Uranium–bismuth alloys
See Bismuth–uranium alloys.

Uranium–bismuth alloys (liquid)
See Bismuth–uranium alloys (liquid).

Uranium–bismuth–lead alloys
See Bismuth–lead–uranium alloys.

Uranium borides
properties of interest for use as refractory fuels, 11: 812
thermal expansion coefficients for UB_2, 11: 2882(J)

Uranium(IV) bromides
crystallographic data, 11: 4513(J)

Uranium–calcium alloys
See Calcium–uranium alloys.

Uranium carbide–aluminum compacts
See Aluminum–uranium carbide compacts.

Uranium carbide–beryllium carbide systems
See Beryllium carbide–uranium carbide systems.

Uranium carbides
(See also systems which contain carbon or graphite and uranium.)
casting of UC_2 and U_2C_3, 11: 7654(R)
corrosion by Bi, 11: 7655(R)
diffusion in graphite at high temperatures, 11: 7904
preparation and microstructure, 11: 11656(R)
properties of interest for use as refractory fuels, 11: 812

Uranium–carbon sandstone deposits
See Carbon–uranium sandstone deposits.

Uranium–carbon systems
See Carbon–uranium systems.

Uranium(III) chloride–barium chloride–potassium chloride systems (liquid)
See Barium chloride–potassium chloride–uranium(III) chloride systems (liquid).

Uranium chloride complexes
with phosphorus chloride, chemical properties, 11: 3325(R)
preparation of tetramethylammonium-, tetraethylammonium- and Cs-, 11: 11145(J)

Uranium(III) chloride–lithium chloride–potassium chloride systems (liquid)
See Lithium chloride–potassium chloride–uranium(III) chloride systems (liquid).

Uranium chlorides
activity coefficients in aqueous solutions, 11: 12339(R)
chemical and physical properties, 11: 5282
paramagnetic resonance absorption in $U^{235}Cl_3$, 11: 3218(P)

Uranium(III) chlorides
electrolytic U recovery from fused, 11: 5093(P)
paramagnetic resonance absorption in single crystals, 11: 5081(J)
production cell for, 11: 7568(R)

Uranium(IV) chlorides
autoxidation to UO_2Cl_2, rate studies, 11: 2403
concentration in aqueous solution, 11: 3232(P)
heat of solution, 11: 8884(J)
oxidation in air at room temperatures, 11: 2392
production from CCl_4–UO_2 reactions, 11: 2402
purification by fractional condensation, 11: 2374
reduction with Li amalgam, 11: 8411(R)
sodium amalgam reduction, 11: 10820(R)
sublimation, effect of geometric and thermal conditions, 11: 13690
x-ray-diffraction analysis, 11: 2388(R)

Uranium–chromium alloys
See Chromium–uranium alloys.

Uranium–chromium alloys (clad)
See Chromium–uranium alloys (clad).

Uranium–chromium alloys (liquid)
See Chromium–uranium alloys (liquid).

Uranium–chromium–molybdenum alloys
See Chromium–molybdenum–uranium alloys.

Uranium–chromium–silver alloys
See Chromium–silver–uranium alloys.

Uranium–chromium–vanadium alloys
See Chromium–uranium–vanadium alloys.

Uranium coatings
preparation, deposition, and corrosion resistance, 11: 7655(R)

Uranium compacts
(See also Slug canning (U compacts).)
dimensional stability, effects of thermal cycling on, 11: 7895
fabrication of spheres by powder metallurgy, 11: 12482
preparation and density, 11: 12497
radiation effects, 11: 7630(R), 10887(R), 11105
radiation effects on hot-pressed, 11: 7629(R)
sintered, powder metallurgy, 11: 13763(R)

Uranium complexes
with acetylacetone, solvent extraction behavior, effects of EDTA on, 11: 3763(J)
with ascorbic acid, preparation, 11: 1840(J)
with chloride, absorption spectra, 11: 3775(J)
with dihydroxymaleic acid, influence of pH on composition, 11: 1839(J)
with fluorides, dissociation constants, 11: 216(J)
formation for U recovery, 11: 2312
orbital hybridization, 11: 222(J)
polarographic behavior of uranyl-cupferron system, 11: 12310(J)
preparation of $UCl_4 \cdot POCl_3$, 11: 13633(R)
preparation of uranyl protoporphyrin, 11: 10053(J)
with tributyl phosphate, analysis, 11: 931

Uranium compounds
chemical reactions of UF_4, U_3O_8, UO_3, UO_2, and UO_2F_2 with $AlCl_3$, 11: 5285
crystallographic data for $2UO_2CrO_4 \cdot UO_3 \cdot 4H_2O$, 11: 3714(J)
direct leaching with organic solvent–HNO_3 mixture, 11: 13015
organic, preparation, 11: 5824
preparation of high-purity, 11: 6996(P)
preparation of quinquevalent alkoxides and complex chlorides, 11: 4397
selective precipitation, 11: 5705(P)
spectroscopic data, 11: 9670
thermal properties of irradiated alkali and alkaline earth uranates, 11: 13088

Uranium concentrates
direct fluorination, flowsheet for, 11: 13582(R)
direct leaching with organic solvent–HNO_3 mixture, 11: 13015
filterability vs. ore composition, 11: 12358
flotation and U separation, 11: 7192(R), 10478(R), 10479(R)
physical properties before and after reduction and hydrofluorination, 11: 13582(R)
processing by fluoride volatility, 11: 9253
smelting to high U content, 11: 7015(P)
uranium recovery from, 11: 7971, 12380, 12415

Uranium–copper alloys
See Copper–uranium alloys.

Uranium crystals
anisotropic elastic properties of, theory, 11: 2557
deformation, 11: 7678(R)

Uranium crystals (cont'd)
dimensional stability during irradiation and thermal cycling, 11: 9900
dimensions, effects of radiation on, 11: 7626(R)
electrical resistivity and magnetoresistivity of single, 11: 8942(R)
fission fragment absorption, 11: 2116(R)
growth, 11: 7568(R)
phase studies, 11: 11657(R)
physical properties of single, 11: 13763(R)
preparation, 11: 8679(R)
preparation and recrystallization, 11: 7629(R)
preparation for elastic constants studies, 11: 7630(R), 11689(R)
preparation of alpha, 11: 8462(R), 9182(J), 10887(R)
preparation of alpha, by a grain-coarsening method, 11: 10386(J)
preparation of single, by the strain-anneal method, 11: 2769
slip and twins in, 11: 11688(R)
slipping and twinning in compressed single, 11: 7626(R)

Uranium deposits
mineral determinations in, of Colo., Mont., N. D., S. D., and Wyo., 11: 5317
distribution and general characteristics, 11: 6353
location in N. Dak. and S. Dak., 11: 1082
in sandstone, geologic data application of punch cards to, 11: 5864(J)

Uranium deposits (Alaska)
geologic investigations, 11: 6357(R)

Uranium deposits (Ariz.)
occurrence in Mohave Co., 11: 6354

Uranium deposits (Calif.)
geologic map of, in Olancha Area, 11: 7191

Uranium deposits (Mont.)
associated with Ag–Pb, chalcedony and mixed-type veins in Boulder Batholith, 11: 2908(J)
occurrence in Eastern and Western, 11: 7996(J)
occurrence in Lone Eagle Mine, 11: 5863(J)

Uranium deposits (N. Mex.)
geophysical prospecting, effect of Rn in drill holes on gamma-ray logs, 11: 11192(J)

Uranium deposits (N. Dak.)
uranium occurrence in lignite in Billings Co., 11: 1082

Uranium deposits (U. S.)
geologic investigations, 11: 6357(R)

Uranium deposits (Utah)
occurrence in Big Buck Mine, costs and mining methods, 11: 3819
occurrence in Marysvale area, 11: 10539
occurrence in Silver King Claims, 11: 6355

Uranium deposits (Wyo.)
exploration study of, in Red Desert Area, Sweetwater Co., 11: 5322(J)
occurrence in Browns Park Formation, 11: 4433
occurrence in Mayoworth Area, 11: 3830(J)

Uranium deuterides
heat of formation, 11: 11563(R)

Uranium ethoxides
preparation and properties, 11: 1495(J)
reactions with Na, Ca, and Al ethoxides, 11: 1496(J)

Uranium fires
control and characteristics, 11: 4761
Uranium fluoride–bromine fluoride systems
See Bromine fluoride–uranium fluoride systems.
Uranium(VI) fluoride–bromine fluoride systems
See Bromine fluoride–uranium(VI) fluoride systems.
Uranium(VI) fluoride–bromine systems
See Bromine–uranium(VI) fluoride systems.
Uranium(IV) fluoride compacts
preparation by-briquetting, 11: 11053(R)
Uranium(VI) fluoride complexes
with sodium fluoride, preparation and properties, 11: 2378
Uranium(IV) fluoride–lithium chloride–potassium chloride systems (liquid)
See Lithium chloride–potassium chloride–uranium(IV) fluoride systems (liquid).
Uranium(III) fluoride–sodium fluoride systems
See Sodium fluoride–uranium(III) fluoride systems.
Uranium(IV) fluoride–sodium fluoride–zirconium fluoride systems
See Sodium fluoride–uranium(IV) fluoride–zirconium fluoride systems.
Uranium(IV) fluoride–sodium fluoride–zirconium fluoride systems (liquid)
See Sodium fluoride–uranium(IV) fluoride–zirconium fluoride systems (liquid).
Uranium(IV) fluoride–uranium(IV) oxide systems
thermal analysis, 11: 7570
Uranium fluorides
(See also Ammonium uranium fluorides.)
disproportionation and fluorination rate of UF_5, U_2F_9, and U_4F_{17}, 11: 3774
precipitation from aqueous solutions, 11: 7142(R)
Uranium(III) fluorides
chemical analysis for uranium, 11: 9600
determination in fluoride salt mixtures, 11: 13704
phase studies of binary systems with SrF_2, $BaCl_2$, and BaF_2, 11: 3372
phase studies of UF_3–BaF_2 system, 11: 7101(J)
Uranium(IV) fluorides
analysis for water, 11: 5256(R), 10852
chemical reactions with $AlCl_3$ and heats of formation, 11: 5285
colorimetric analysis for Ni, 11: 12971(R)
comparative analytical results of Mallinckrodt-, and National Lead-produced, 11: 12348(R)
concentration of U^{237} in, 11: 3236(P)
contamination during production in moving bed reactor, 11: 10810(R)
conversion to UF_6 in a fluidized bed reactor, 11: 9581(R)
conversion to UO_4 by $Al(NO_3)_3$ process, 11: 2373
co-reduction with ZrF_4 for preparation of U–Zr alloys, 11: 8528
corrosive effects on illium R, 11: 9690
crystal structure, x-ray determination, 11: 12001(J)
dehydration in Exer Process, 11: 7139(R)
dehydration in N_2 atmospheres at elevated temperatures, 11: 7574
deterioration during storage in steel drums, 11: 10853
electrical measurements to detect differences in samples, 11: 7897
elimination of water from, 11: 7142(R)
fluidization with N_2 at 600°C, 11: 9666
fluidization with sea sand in Fluorox equipment, 11: 12965(R)
Uranium(IV) fluorides (cont'd)
fluorination, 11: 10849
fluorination by gaseous ClF_3, 11: 10848
hydrofluorination, equipment for, 11: 12405(R)
hydrolysis, 11: 13675(R)
oxidation, 11: 8359(R)
oxidation by O_2 in Fluorox Process, kinetics, 11: 7139(R)
oxidation in moving bed reactor, 11: 11053(R)
oxidation to UF_6 by O_2, 11: 5284
oxidation to UO_3 or U_3O_8, pilot-plant study, 11: 7586(R)
preparation, 11: 4389(J)
preparation and fluorination, 11: 11565
preparation by a high-temperature electrochemical process, 11: 10845
preparation by fluorination of UO_2, rate equation, 11: 9271
preparation by precipitation from uranyl nitrate solutions, 11: 8418
preparation by reduction of UF_6 with trichloroethylene, 11: 8420, 12715
preparation by U metal hydridization and subsequent hydrofluorination, 11: 7418(R)
preparation by wet process, 11: 13036
preparation from U_3O_8 by the dry method, effect of process variables on, 11: 13032
preparation from UO_3, UO_2 hydrate, or UO_2F_2, 11: 7573
preparation from uranyl ammonium phosphate, 11: 7588, 8422, 13029
preparation from UO_2F_2, 11: 8411(R), 12419
production, 11: 9674(R), 9696
production, cost comparison for Excer and Moving-Bed methods, 11: 7495
production, development of continuous process, 11: 9580(R)
production, improvement of process for, 11: 3234(P)
production, pilot-plant tests for, 11: 8413
production, process, equipment, and plant description, 11: 12379
production and reduction, 11: 9694
production by continuous methods, 11: 9679(R), 9681(R), 9686(R)
production by continuous UO_2 conversion, 11: 9689(R)
production by Excer Process, product analysis, 11: 12966(R)
production by fluidized bed process, 11: 6317
production by fluorination of UO_2, 11: 3367(J), 11663, 12332(R)
production by Fluorox and Excer Processes, 11: 10836(R)
production by Excer Process, 11: 7417(R), 7900, 9665, 12995(R)
production by reaction of UO_2 with HF at 550°C, 11: 9695
production by reduction and hydrofluorination of UO_2 using starch as reducing agent, 11: 10502
production by reduction of UF_4 with H, 11: 7578
production from U ore concentrates by fluidization, 11: 7408(R)
production from UO_2, poor conversions in, 11: 13701
production from UO_2 in moving-bed reactors, 11: 7507(R)
production from UF_6 and solubility in HF, 11: 12971(R)
production from UO_2 pellets in a moving bed reactor, 11: 10814(R)
production from UNH by ion exchange and electrolysis, 11: 8409
production in a moving bed reactor, 11: 10810(R)
production in moving bed reactor process, 11: 10858(R)
purification from carbon by oxidation, 11: 12417
pyrochemical transfer of Pu from spent to fresh U using, 11: 7547
reaction with UF_6, 11: 11140

Uranium(IV) fluorides (cont'd)
reduction, 11: 7679, 9636, 13040, 13041
reduction, effects of excess Mg on, 11: 7564
reduction, evaluation of refractory materials for, 11: 7600
reduction by Mg for production of U metal, 11: 7587, 7654(R), 9537(P), 9544(P)
reduction for production of U in refractory lined crucibles, 11: 9713
reduction in bomb, effect of moisture content, 11: 12395
reduction to metal, behavior of Ru and P during, 11: 12438
reduction to metal of enriched, pilot plant standard operating procedure for, 11: 10844
reduction with magnesium, effects of Mg quality on, 11: 7565
spectrographic analysis for rare earths, 11: 12352(R)
spectrophotometric analysis for Si, 11: 1429(R)
standard samples, preparation by hydrofluorination of UO_2, 11: 7897
volumetric analysis for U, 11: 7589
Uranium(IV) fluorides (liquid)
extraction of uranium and volatilization, 11: 8387(R)
Uranium(VI) fluorides
concentration of U^{237} by neutron bombardment, 11: 3236(P)
consumption rates in Consolidated Model 21-221 and General Electric Nier-type 60° mass spectrometers, comparison of, 11: 12514
conversion to sulfate by concentrated H_2SO_4, 11: 11496(P)
critical ionization potentials, 11: 2372
criticality as a reactor core material, 11: 13956
determination in N_2 by rate of reaction with salicylic acid, 11: 11511(P)
distillation costs, 11: 12585(R)
distillation from fluorinated irradiated U, 11: 12374
flame propagation in UF_6–H mixture, 11: 12406(R)
gravimetric analysis for U, 11: 13695
gravimetric determination of U in, 11: 8295
handling, shipping, and storage, 11: 4393
hydrolysis, 11: 11632(R), 13698(R)
hydrolysis to UO_2F_2, 11: 215
infrared spectra of liquid, at 75 to 80°C, 11: 9983(R)
intermolecular interactions, 11: 13697
mass spectrometric analysis, 11: 13849
mass spectrographic analysis of, precision of two methods, 11: 11735
physical and chemical properties, 11: 4393
preparation, 11: 11565
preparation, physical properties, and volatilization, 11: 11653
preparation by fluorination of U oxides, 11: 3370, 8425
preparation by fluorination of UF_4, 11: 7418(R), 13582(R)
preparation by reaction of UF_4 and O_2, 11: 5284
preparation by single step dry process, 11: 7575
preparation from ore concentrates, 11: 12415
preparation from uranium fuel elements by Fluoride Volatility Process, 11: 11968
preparation from UF_4, methods and equipment, 11: 218(J)
preparation from UF_4 using BF_3, 11: 10849
preparation from $(UO_2)_3NH_4PO_4$, 11: 13706(R)
preparation from uranyl ammonium phosphate in batch vapor phase reactor, 11: 11665
preparation methods for gram amounts, 11: 8419
Uranium(VI) fluorides (cont'd)
preparation using ClF_3, 11: 10847, 10848
production, 11: 9267
production by reacting UO_3 with HF followed by fluorination, 11: 3219(P)
production from Belgian Congo ore, 11: 11661
radiolysis under reactor conditions, 11: 7585
reaction with H_2SO_4 for preparation of uranium(VI) sulfate, 11: 10495
reaction with UF_4, 11: 11140
recovery, equipment and operating conditions for, 11: 9671
recovery from inert diluent gases in the fluoride volatility process, 11: 12709(J)
reduction bibliography, 11: 2226
reduction by H_2, activation energy, 11: 10811(R)
reduction to UF_4, 11: 7418(R)
reduction to UF_4 by trichloroethylene, 11: 12715
reduction to UF_4 by trichloroethylene, continuous process, 11: 8420
reduction with H for production of UF_4, 11: 7578
separation from Br fluorides by sublimation, vacuum distillation, batch recrystallization, and zone melting, 11: 13580(R)
separation from Br–UF_6 and BrF–UF_6 systems, 11: 10822
separation from fission product fluorides by distillation columns, 11: 7476
separation from MoF_6 by distillation, 11: 11596
separation from PuF_6, 11: 9581(R)
separation from volatile halogenated hydrocarbons by hydrolysis, 11: 7005(P)
separation of U with separation nozzle, 11: 1024(J)
solubility in several insert solvents, 11: 12715
sorption on NaF at 300°C, 11: 13656(R)
spectrographic analysis for Mo, 11: 2257
thermal decomposition, 11: 12405(R)
thermal diffusion coefficient, 11: 9897
Uranium–germanium alloys
See Germanium–uranium alloys.
Uranium foils
preparation, 11: 13085
Uranium–gold alloys
See Gold–uranium alloys.
Uranium–graphite systems
See Graphite–uranium systems.
Uranium halides
electrolysis of fused, graphite crucible for, 11: 5085(P)
electrolysis of fused, U recovery by, 11: 7002(P)
electrolytic apparatus for separation from fused salts, 11: 5086(P)
reduction, crucible liners for, 11: 11521(P)
reduction bomb liner fabrication, 11: 7020(P)
Uranium(IV) halides
reduction in ether solution by alkali metal aluminum hydride, 11: 11507(P)
Uranium hydride compacts
dimensional stability, effects of thermal cycling on, 11: 7895
Uranium hydrides
(See also specific systems which contain hydrogen and uranium.)
absorption of H by, 11: 4390
acid leaching, 11: 12429(R)

Uranium hydrides (cont'd)
analysis, 11: 945(R), 13702
analysis for O_2 and N_2 content, 11: 12349
chemical properties, 11: 12429(R)
criticality studies, 11: 4093
crystal structure, 11: 5286, 12003(J)
dissociation pressure, 11: 4394
dissociation pressure compared with UT_3, 11: 9578(R)
grain growth characteristics and phase transformations of hot-pressed, 11: 11011
heat of formation, 11: 10901, 11563(R)
heat of formation of UH_3, 11: 8886(J)
hot pressing, 11: 9745(R), 13702
hydrogen cooling of multiplying systems of, 11: 4768(J)
lattice parameters, x-ray-diffraction analysis, 11: 7279(J)
magnetic properties, 11: 12738, 13189(R)
nonstoichiometry, 11: 12003(J)
nucleation and growth in metallic U, effect of cooling rate, 11: 3416
powder metallurgy, 11: 12429(R)
powder metallurgy, hot pressing equipment and procedures for, 11: 12434
preparation, 11: 12429(R), 12436, 13702
preparation by reduction of uranium oxides, 11: 2399(R)
production by reduction of uranium oxides with CaH_2, 11: 12428(R)
vapor pressure, 11: 10901

Uranium–hydrogen systems
See Hydrogen–uranium systems.

Uranium ions
diffusion current constants, 11: 8282(R)
paramagnetic resonance, 11: 817(J)

Uranium(III) ions
luminescence properties in crystals, 11: 12311(J)

Uranium(IV) ions
hydrolysis, 11: 4395(J), 8884(J)
oxidation by γ rays, 11: 8284(R), 9587(R)
oxidation by molecular O_2 in $HClO_4$, 11: 217(J)
reduction of Pu by, 11: 6693(J)

Uranium(V) ions
chemical reactions analysis, 11: 7430(R)
coulometric agent for determination of Fe^{3+}, 11: 1439

Uranium(VI) ions
extraction from aqueous solutions with organic solvents, 11: 9274(J)
paper chromatographic separation with 2-methyltetrahydrofuran, 11: 7558

Uranium–iridium alloys
See Iridium–uranium alloys.

Uranium–iron alloys
See Iron–uranium alloys.

Uranium isotopes
(Isotopes identified as U_I, UX_1, etc., have been indexed as in the table below.)

For	See
U_I	Uranium isotopes U^{238}
U_{II}	Uranium isotopes U^{234}
UX_1	Thorium isotopes Th^{234}
UX_2	Protactinium isotopes Pa^{234}
UY	Thorium isotopes Th^{231}
UZ	Protactinium isotopes Pa^{234}

Uranium isotopes (cont'd)
analysis, sample preparation, 11: 6258(R)
consumption and production for U^{238}–U^{235} fuel mixtures, 11: 4215
cross sections, and reactions, 11: 9578(R)
delayed neutrons from fissionable, 11: 13456(J)
deuteron reactions of U^{234}, U^{235}, and U^{238}, 11: 7091(R)
electromagnetic separation, 11: 9888(R)
electromagnetic separation experiments, 11: 13846(R)
formation and criticality effects in Th–U^{233} breeder reactors, 11: 7814
formation by neutron irradiation of U^{232}, 11: 4762
fractionation by ion exchange, 11: 8557(R)
interferometric determination, 11: 6264(J)
neutron cross sections, 11: 590(J)
neutron resonances and cross sections, 11: 10229
nuclear properties, direct comparison, 11: 13517(J)
ratio determination, 11: 9771(R)
reactor criticality effects, 11: 2725
relative abundance determination, electrodeposition for, 11: 2256
separation, feasibility of photochemical methods for, 11: 11826
separation by centrifugation, 11: 8987(J)
separation by chemical exchange, 11: 9555(P), 11578(R), 12409, 12410
separation by gaseous diffusion, linear programming model applied to, 11: 4558
separation by ion exchange, 11: 7704, 12391
separation by thermal diffusion, 11: 7701
separation in countercurrent gas centrifuge, 11: 5425(J)
separation with nozzle, 11: 1024(J)
spontaneous fission energy release, calculated, 11: 13444
thermal neutron cross sections, review, 11: 10245
x-ray transition, 11: 3217

Uranium isotopes U^{230}
alpha and γ spectra and decay schemes, 11: 780(J)
production from deuteron bombardment of Th, 11: 13201

Uranium isotopes U^{232}
nuclear properties, 11: 11493
production from deuteron bombardment on Th, 11: 13201
production in Th breeder reactors, 11: 1373
separation from irradiated Th^{228}, 11: 13633(R)

Uranium isotopes U^{233}
alpha emission, angular distribution of, 11: 4016(R)
alpha spectra, 11: 3604(J)
capture-to-fission ratios, 11: 590(J), 713(J), 714(J), 1654(J), 9752(R), 11348
composition of re-irradiated, 11: 4553
concentration of 23-Process solutions by ion exchange, 11: 8394
critical parameters, 11: 1654(J)
criticality of aqueous solutions, 11: 1618(R)
criticality study in Thorex pilot plant, 11: 12703
cross sections, α, η, ν, and Γ, 11: 10244
cross sections and multiplication factor, 11: 9440
delayed neutron emission, 11: 590(J), 13430(R)
delayed neutrons from fast fission, 11: 4985(J)
determination in extraction process solutions, 11: 4280
determination in irradiated Th, 11: 9052(R)
determination in MTR Th slugs by nondestructive methods, 11: 5020

Uranium isotopes U^{233} (cont'd)

deuteron reactions and fission-spallation competition from Np^{236}, 11: 3578

dissolution of ThO_2 slugs for determining U^{233}/Th ratio, 11: 7437

energy levels, 11: 5533

energy variation, direct measurement of η for, 11: 2066(J)

evaporation of atoms from surface of, on emission of fission fragments or α particles, 11: 5524(J)

fission, total atom burnup and specific power of natural Th from, 11: 7866

fission cross sections for fast neutrons, 11: 3052(J), 11564(R)

fission cross sections in neutron energy range 30 kev to 5 Mev, 11: 12200(J)

fission neutron spectrum, 11: 1618(R), 2622

fission neutron yield per neutron absorbed in, energy dependence, 11: 590(J), 12312(J)

fission processes for, 11: 12507

half life, 11: 11564(R)

hyperfine structure of emission lines, quadruple moment of, theory, 11: 2227(J)

isolation from irradiated Th metal using TBP as extractant, 11: 8341(R)

magnetic spin and quadrupole moments, ratio to those of U^{234}, 11: 6512(J)

natural radioactivity in Thorex Process, 11: 7499

neutron absorption, 11: 11740(R)

neutron cross sections, 11: 1276(R), 1636, 1654(J), 2063(J), 4034, 4685(R), 6010, 8141

neutron cross sections, 2200 m/sec, 11: 11357

neutron fission cross sections, 11: 7311, 12888(R), 13430(R)

neutron fission cross sections in the energy range 0.030 Mev to 3.0 Mev, 11: 11387(J)

neutron irradiation of, formation of higher isotopes by, 11: 4762

neutron resonance parameters, 11: 12196(J)

neutron resonances, 1654(J), 8562(R)

neutron yield per thermal fission, 11: 12077(J)

nuclear moment, ratio to U^{235}, 11: 9526(J)

nuclear properties, 11: 5081(J), 11493

photoneutron emission, 11: 6547(J), 10319(J)

preparation, 11: 7709(R), 11493

production by irradiation of Th–U plates, 11: 9891

production by neutron bombardment of Th^{232}, 11: 8693, 12507

production from neutron-irradiated ThO_2, 11: 8287

production from neutron irradiation of natural Th and radioactive decay of Pa^{233}, 11: 7866

production in breeder reactors, 11: 1373, 2724, 6097(J)

production methods and problems, 11: 7567

production of high-purity powder, 11: 7156(J)

production rates in NRX Reactor, 11: 3076

proton fission product yield, 11: 8191

purification and concentration in Thorex Process, 11: 8345

recovery from irradiated Th, 11: 3367(J), 13837(R)

recovery from solutions of Th by methyl isobutyl ketone, 11: 7553

recovery from Th and fission products, solvent extraction methods for, 11: 7539(R), 8392, 12330(R)

recovery from Th and fission products in continuous column operations, 11: 8391

separation, 11: 11493

separation and decontamination in Thorex Process, laboratory development studies, 11: 8395(R)

Uranium isotopes U^{233} (cont'd)

separation and purification from solutions containing thorium nitrate, 11: 7540

separation costs of, from Th breeder blankets, 11: 9618

separation from irradiated Th, process for, 11: 9654

separation from Th and fission products by solvent extraction and ion exchange, 11: 6694

separation in 23 Process, 11: 12393(R)

spectrographic determination in irradiated Th, 11: 11085

thermal neutron absorption and fission cross sections, 11: 9776

thermal neutron absorption cross section, 11: 6992(J)

Uranium isotopes U^{234}

alpha particle energy from, 11: 5538(J)

energy levels, 11: 9579(R)

neutron cross sections, 11: 3052(J), 6036

fast neutron cross sections, 11: 11564(R)

neutron fission cross sections, 11: 7713

nuclear properties, 11: 11493

nuclear spallation with 9 to 25 Mev deuterons, 11: 3330(R)

production from neutron irradiation of natural Th, 11: 7866

radiometric determination in U, 11: 11659

Uranium isotopes U^{235}

absolute fission yield of Cs^{137} by fast neutron, 11: 9581(R)

abundance determination by γ spectrometry, 11: 14040

accountability, security, and health physics procedures for, in exponential studies, 11: 12962

activation and fission counting analysis of, in Topsy and Godiva, 11: 13954

alpha emission, angular distribution of, 11: 4016(R)

alpha spectra and decay scheme, 11: 12933

burnup, effect on reactivity of reactor, 11: 4979(J)

burnup in MTR, 25 Process verification by, 11: 8332

capture-to-fission ratio, in the EBR-I, 11: 13513(J)

capture-to-fission ratios, 11: 590(J), 12504(R), 13857, 13965

consumption rate, 11: 8685(R)

consumption rate and separation of, in EBR, 11: 9784

consumption rate in research reactor, calculation, 11: 1

consumption rate in SRE, 11: 12575(R)

Coulomb excitation, γ rays from, 11: 8144(J)

critical dimensions of pipes carrying D_2O solutions of, 11: 6520

critical experiments with, in Godiva, 11: 13953

critical hazards of interacting containers of, general theory, 11: 13853

critical mass in uranyl fluoride solutions, 11: 11006, 11007

critical mass of, in H_2O tamped and moderated spheres, 11: 11008

critical mass of hydrogenous systems containing, 11: 13831

critical parameters, 11: 1654(J)

criticality of aqueous solutions, 11: 1618(R)

criticality of assemblies, 11: 5079

criticality studies, application to control of 25 Process, 11: 13664

criticality studies of, in UO_2F_2 in right cylinders, 11: 13855

criticality studies of oralloy assemblies, 11: 9185(J)

criticality studies of H_2O-reflected, 11: 11828

criticality studies on cylinders, 11: 11827

decontamination and purification of, from heterogeneous pile, 11: 12392(R)

Uranium isotopes U^{235} (cont'd)
delayed neutron emission from fission, 11: 11782
delayed neutrons from fast fission, 11: 4985(J)
delayed neutrons per fission, effect on pile neutron behavior, 11: 3552
determination by radioactivation, 11: 9590(R)
determination in fuel discs by induced fission counting, 11: 13106
determination of ν(E), 11: 7713
Doppler coefficient of dilute systems of, 11: 13563
energy levels, 11: 5533
energy variation, direct measurement of η for, 11: 2066(J)
equations for MTR burnup apportionment, 11: 13146
fast fission, yield of Cs^{137}, 11: 11309(J)
fast fission of, fission product yields from, 11: 10719
fast neutron cross sections, 11: 11564(R)
fission, 11: 13965
fission, epithermal, 11: 11348
fission, gamma rays from, 11: 2026(R), 14031(R)
fission, γ rays from thermal neutron induced, 11: 6863(R)
fission, measurement from Zr^{95} yields, 11: 12503
fission, production of isotopes of Kr and Xe in, 11: 1218(J)
fission and spallation competition, 11: 12268
fission fragments, energy distribution of mass-97, 11: 2230(J)
fission in EBR, 11: 7690(R)
fission neutron spectrum, integration, 11: 4216(J)
fission neutron spectrum from 0.2 to 3 Mev, 11: 1288
fission neutrons per thermal capture, 11: 590(J)
fission parameters, 11: 12196(J)
fission product activity after reactor irradiation, 11: 5670
fission product decay, calculation of, 11: 2738
fission product poisoning, energy dependence, 11: 6183(J)
fission product production as a function of thermal neutron flux, irradiation time, and decay time, 11: 11491
fission product studies by magnetic analysis, 11: 11492
fission product yields and properties, 11: 3934
fission products, calculated activities and abundances, 11: 8982
fission rate measurements in CP-4, 11: 9780
fission thresholds studied by (d,p) stripping reactions, 11: 6507
flux and power distribution and reactivity in MTR using, 11: 13495
gamma emission, 11: 11739(R)
gamma transition energies, 11: 4062(J)
half life and decay scheme, 11: 9525(J)
half life and specific activity, 11: 2254(R)
isomeric state, 11: 10799(J)
isomeric state, 27 minute, 11: 10800(J)
isotopic abundance in Colorado Plateau U ores, 11: 5867(J)
magnetic spin and quadrupole moments, ratio of those of U^{233} to, 11: 6512(J)
mass spectrometer assay of, 11: 13030
mass spectrometric determination in UF_6, 11: 13849
measurement of $(1 + \alpha)$ in thermal region, 11: 13884(R)
multiplication factor, 11: 9440
neutron absorption, 11: 11740(R)
neutron cross sections, 11: 590(J), 1273(R), 1654(J), 8141, 9440, 10244

Uranium isotopes U^{235} (cont'd)
neutron cross sections, 2200 m/sec, 11: 11357
neutron elastic scattering from, angular distributions, 11: 1683(J)
neutron fission cross sections, 11: 1273(R), 1274(R), 4034, 6010, 7311, 8574, 9771(R), 10228, 12888(R)
neutron fission cross sections, comparison to capture cross section of Au^{197}, 11: 5493(R)
neutron fission cross sections in the energy range 0.030 Mev to 3.0 Mev, 11: 11387(J)
neutron fission cross sections in the range 30 kev to 5 Mev, 11: 12200(J)
neutron fission cross section ratio to U^{238}, Th, and Pu, 11: 11745(R)
neutron fission cross section variation from 100 to 10,000 ev, 11: 9183(J)
neutron induced binary fission, velocities of fragment pairs of, 11: 1635
neutron lifetime in, 11: 12854
neutron resonances between 2 and 200 ev, 11: 11348
neutron total cross sections, 11: 7690(R)
neutrons emitted in single neutron capture event, 11: 713(J), 714(J)
nuclear properties, 11: 11493
nuclear quadrupole moment, 11: 3218(P)
perturbations due to, near MTR core, 11: 2689
photofission cross sections from 150 to 500 Mev, 11: 6880(J)
price estimates, 11: 224(J)
purification to spectrographic-grade product, 11: 13001
radiometric determination, a comparison of methods, 11: 10506(J)
radiometric determination in U bars, 11: 10813(R)
reactivity changes in thermal reactors from burnup of, 11: 13865
recovery and decontamination from HRE fuel solutions, 11: 7502
recovery from heterogeneous reactors, 11: 12388(R)
recovery from homogeneous reactor solutions by solvent extraction with hexone, 11: 12389
recovery from irradiated fuel elements by hexone extraction, 11: 12362
recovery from spent fuel by solvent extraction, 11: 12330(R)
recovery from spent MTR slugs by solvent extraction with TBP, 11: 9660
reprocessing costs, fuel diluent effects on, 11: 198(J)
resonance fission, 11: 10801(J)
resonance structure, 11: 1654(J)
separation, developments on industrial scale, 11: 12127(J)
separation by thermal diffusion, 11: 9897
separation by thermal diffusion and distillation, 11: 11593
separation from U^{238}, 11: 6316(J)
specific activity, 11: 9591(R)
spectrographic determination in natural or depleted uranium, 11: 2824
spectrographic determination in U_3O_8, 11: 10816
spin and ratio of nuclear moment to U^{233}, 11: 9526(J)
storage and shipping of, safety criteria, 11: 14042
storage of, criticality considerations, 11: 5079
storage of aqueous solutions, 11: 13302
temperature effects on Doppler broadening of resonances in, 11: 8758
thermal neutron absorption and fission cross sections, 11: 9776
thermal neutron fission, yields in, 11: 1654(J), 12077(J), 12254(J)
weight percentage in natural U, 11: 8427
wire, fabrication, 11: 11829

Uranium isotopes U^{236}

fast fission cross sections, 11: 3052(J)

fast neutron cross sections, 11: 11564(R)

formation in EBR, 11: 7690(R)

gamma transition energies, 11: 4062(J)

neutron capture cross sections, 11: 7861(R)

neutron cross sections, 11: 6036

neutron fission cross sections, 11: 7713

purification, 11: 9888(R)

radiative capture cross section, 11: 9184(J)

spontaneous fission, half life, and alpha activity, 11: 13576(R)

Uranium isotopes U^{237}

beta decay spectra, 11: 10760(J)

concentration in UF_4 produced by neutron bombardment of UF_6, 11: 3236(P)

decay scheme, 11: 8266(R)

disintegration rate determination, 11: 4388

electron spectrum and decay scheme, 11: 820(J)

formation, 11: 13197(R)

nuclear properties, 11: 11493

production from deuterons and protons on U, 11: 10996(R)

recovery from cellulose pulp column, 11: 1493

Uranium isotopes U^{238}

alpha particle energy from, 11: 5538(J)

Coulomb excitation, γ rays from, 11: 8144(J)

delayed neutrons from fast fission, 11: 4985(J)

delayed neutrons per fission, effect on pile neutron behavior, 11: 3552

deuteron reactions, 11: 13197(R)

deuteron reactions (d,2n) and (d,4n) from threshold to 190 Mev, excitation functions, 11: 13191

electromagnetic separation, 11: 13836(R)

energy levels, 11: 10686(R), 11739(R)

energy levels excited by inelastic neutron scattering, 11: 6184(J)

fast effect in lattices, 11: 3568(J)

fast fission, variation with homogeneity in infinite slab reactor, 11: 13150

fast neutron cross sections, 11: 11564(R)

fission by deuterons and fast neutrons, 11: 9186(R)

fission by high-energy particles, 11: 12078(J)

fission cross section of, by protons of 140 to 660 Mev energy, 11: 12957(J)

fission cross section ratio to U^{235}, 11: 11745(R)

fission product distribution from proton and deuteron bombardment, 11: 10996(R)

fission products, 11: 13837(R)

fission rate measurements in CP-4, 11: 9780

fission thresholds studied by (d,p) stripping reactions, 11: 6507

gamma emission, 11: 11739(R)

isotopic abundance in Colorado Plateau U ores, 11: 5867(J)

mass spectrometric determination in UF_6, 11: 13849

neutron capture cross sections, 11: 10228, 10244, 13965

neutron capture cross sections below 1 Mev, fast, 11: 11386(J)

neutron capture gamma spectrum, 11: 4763

neutron cross sections, 11: 9772(R)

neutron elastic scattering from, angular distributions, 11: 1683(J)

neutron energy levels, 11: 10232(R)

Uranium isotopes U^{238} (cont'd)

neutron fission cross sections, 11: 3052(J), 4984(J), 7311, 7713, 8574

neutron fission cross sections in the energy range 0.030 Mev to 3.0 Mev, 11: 11387(J)

neutron resonance absorption, 11: 682(J), 14031(R)

neutron resonance cross sections, Doppler effects on, 11: 9770

neutron resonance integral, effective, 11: 1337(J)

neutron resonance integral measuring apparatus, 11: 7846(R)

neutron resonance integrals, temperature coefficients of, 11: 13968(R)

neutron resonance parameters of, 11: 4771(J), 12196(J), 13884(R)

neutron resonances, 11: 607(J), 1618(R), 8562(R), 9078(J)

neutron scattering cross sections, 11: 10247

neutron total cross sections, 11: 9078(J)

neutron transmission, 11: 4771(J)

neutron transport cross sections, calculations of, 11: 8569

photofission, low-energy activation functions for, 11: 4990(J)

photofission and photoneutron emission, 11: 1350(J), 6547(J)

photofission cross sections from 150 to 500 Mev, 11: 6880(J)

photoneutron emission, 11: 10319(J)

production of Pu^{238} from, 11: 2142(J)

proton reactions, excitation functions for, 11: 2629

radiometric determination in U, 11: 11659

separation by thermal diffusion and distillation, 11: 11593

spontaneous fission half-life, 11: 1641, 4396

Uranium isotopes U^{239}

energy levels studied by U^{238} (n,γ) reaction, 11: 4763

neutron-binding and disintegration energies, 11: 8265(R)

neutron fission cross sections, thermal, 11: 6042(J)

Uranium leach precipitates

carbonate leaching, 11: 2397

calcining-amenability testing of Rand, 11: 9672

chemical analysis, 11: 5206

dissolution, 11: 12376(R)

uranium recovery, 11: 2382

uranium recovery from acid press-cake, 11: 12381

Uranium leach residues

chemical analysis, 11: 5206

chemical analysis for Th and Pa, 11: 11493

filtration and settling tests, 11: 995

pulp suspension of, reagents testing, 11: 11176

radiometric analysis for Pa, 11: 4291(J)

radiometric analysis for Ra, 11: 5781

recovery of U by H_2SO_4 digestion and precipitation, 11: 7004(P)

uranium recovery, 11: 2382

Uranium leach residues (acid)

recovery of Ra by extraction with 100% H_2SO_4, 11: 9626(R)

recovery of Ra from, 11: 9627(R)

Uranium leach residues (carbonate)

extraction of U as uranyl ammonium phosphate, 11: 1816(R)

purification, 11: 1815(R)

uranium recovery, 11: 1479(R), 1480(R), 1481(R), 1483(R), 1484(R), 1485(R), 1486(R), 1813(R), 1814(R), 1819(R), 1820(R), 1821(R), 9614, 9692(R)

Uranium leach solutions
absorption of U by ion exchange, 11: 11629(R)
chemical analysis, 11: 5206
concentrated, effect of recirculation on, 11: 7584
continuous β counting of, 11: 2349
filtration, 11: 3761
filtration for U recovery, 11: 5266
precipitation, 11: 9744
precipitation of U in, 11: 2277, 2861
precipitation of $U_3(PO_4)_4$, 11: 2404
processing for Mo and Fe removal, 11: 1488
radiometric analysis for U in phosphatic, 11: 2276
reduction and neutralization, 11: 2396
separation of Pa from, 11: 2869(J)
solvent extraction, 11: 2356
solvent extraction of Mo-containing, 11: 5262(R)
solvent extraction with amines and alkylphosphoric acids, 11: 11655(R)
spectrophotometric analysis for U using methyl isobutyl ketone–butyl cellosolve–water medium, 11: 6260(J)
uranium recovery, 11: 2382, 8864
uranium recovery by ion exchange, 11: 2928(J), 12995(R)
uranium recovery by solvent extraction, 11: 977, 3758(R)
uranium recovery by solvent extraction with TBP and amines, 11: 981, 1823(R), 1824(R), 2856(R), 2858, 3758(R), 5256(R)
vanadium recovery by solvent extraction, 11: 13290
Uranium leach solutions (acid)
aqueous U phase formation by NH_4OH addition to ether–H_3PO_4, 11: 7537(R)
filtration, 11: 5265
ion exchange, 11: 2350, 4366, 5265, 6296, 9630(R), 12708
precipitation of U from, with long-chain amidines, 11: 11512(P)
precipitation of U from reduced, effect of phosphate and limestone, 11: 2395
recovery of HNO_3, 11: 5092(P)
recovery of U, 11: 1479(R), 1480(R), 1481(R), 1483(R), 1484(R), 1485(R), 1486(R), 1813(R), 1818(R), 1819(R), 1820(R), 1821(R), 2314, 2357, 2359, 2361, 6296
recovery of U and V by ion exchange, 11: 1018(R)
recovery of U and V by phosphate precipitation, 11: 2360
recovery of U and V by solvent extraction with amines, 11: 186(R)
recovery of U by ion exchange and precipitation, 11: 991, 995, 2318(R), 2348, 3363, 7147
recovery of U by solvent extraction, 11: 176, 7147
recovery of V, 11: 2302
reduction to U^{4+} and phosphate precipitation of U for recovery, 11: 6999(P)
solvent extraction and filtration, 11: 8873
solvent extraction by hydrocarbons, 11: 12704
solvent extraction by TBP and amines, 11: 214, 975, 982(R), 2338
solvent extraction using organic solvents, 11: 7146
solvent properties for U minerals, 11: 1020
uranium extraction by amines, 11: 12706
uranium recovery, 11: 12385(R)
uranium recovery by char-in-pulp process, 11: 6683
Uranium leach solutions (carbonate)
concentration of U in, 11: 2405
Uranium leach solutions (carbonate) (cont'd)
electrolysis, U and V recovery, and sodium amalgam reduction, 11: 13293
electrolytic reduction, 11: 989
extraction of U from Rand precipitation, 11: 2352
filtration, 11: 12708
precipitation, 11: 11647(R)
precipitation of U from, 11: 2317(R), 9531(P)
recovery of NH_3, 11: 996
recovery of U by ion exchange and precipitation, 11: 991, 3363
recovery of V by a lead vanadate-caustic treatment, 11: 990
solvent extraction by hydrocarbons, 11: 12704
solvent extraction with alkyl phosphoric acids, 11: 982(R)
solvent properties for U minerals, 11: 1020
uranium oxide dissolution in, effect of oxidants on, 11: 11980
uranium recovery, 11: 12707
uranium recovery on strong-base quaternary amine anion exchange resin, 11: 6994(P)
uranium separation by precipitation, 11: 8879(J)
Uranium leach solutions (organic)
uranium separation using Amex process, 11: 8356
Uranium–lead alloy slurries
See Lead–uranium alloy slurries.
Uranium–lead alloys
See Lead–uranium alloys.
Uranium–lead alloys (liquid)
See Lead–uranium alloys (liquid).
Uranium–magnesium alloys
See Magnesium–uranium alloys.
Uranium–magnesium compacts
See Magnesium–uranium compacts.
Uranium–manganese alloys
See Manganese–uranium alloys.
Uranium–mercury alloys
See Mercury–uranium alloys.
Uranium minerals
(See also Uranium ores.)
age and infinite multiplication constant, 11: 2881(J)
age and nuclear physical stability, 11: 272(J)
age estimation from U/Pb isotopic ratios, 11: 6358
boltwoodite, a new U silicate, 11: 1086(J)
composition, structure, and occurrence, 11: 6312(J)
distribution of secondary, in W. Wilson Mine, Boulder Batholith, Mont., 11: 4444(J)
francevillite, discovery in French Equatorial Africa, 11: 10540(J)
identity and conditions of deposition, chemical, optical, and x-ray data, 11: 1871(J)
occurrence of brannerite in Rajasthan, India, 11: 1085(J)
oxygen isotope variations in, 11: 5374(J), 8001(J)
properties, summary, 11: 5321(J)
prospecting in U. S. and Canada for, 11: 3411(J)
roasting, oxidation, and solubility in acid and carbonate leach solutions, 11: 1020
secondary, x-ray and spectroscopic data on, at W. Wilson Mine (Mont.), 11: 6359(J)
sulfides, paragenesis, 11: 4440(R)
Uranium–molybdenum alloys
See Molybdenum–uranium alloys.

Uranium–molybdenum alloys (clad)
See Molybdenum–uranium alloys (clad).

Uranium–molybdenum alloys (liquid)
See Molybdenum–uranium alloys (liquid).

Uranium–molybdenum alloys (Zr alloy clad)
See Molybdenum–uranium alloys (Zr alloy clad).

Uranium–molybdenum–niobium alloys
See Molybdenum–niobium–uranium alloys.

Uranium–molybdenum–platinum alloys
See Molybdenum–platinum–uranium alloys.

Uranium–molybdenum–plutonium alloys
See Molybdenum–plutonium–uranium alloys.

Uranium–molybdenum–titanium alloys
See Molybdenum–titanium–uranium alloys.

Uranium–molybdenum–zirconium alloys
See Molybdenum–uranium–zirconium alloys.

Uranium–nickel alloys
See Nickel–uranium alloys.

Uranium–nickel–titanium alloys
See Nickel–titanium–uranium alloys.

Uranium–niobium alloys
See Niobium–uranium alloys.

Uranium–niobium alloys (clad)
See Niobium–uranium alloys (clad).

Uranium–niobium alloys (Zr alloy clad)
See Niobium–uranium alloys (Zr alloy clad).

Uranium–niobium–platinum alloys
See Niobium–platinum–uranium alloys.

Uranium–niobium–tin–zirconium alloys
See Niobium–tin–uranium–zirconium alloys.

Uranium–niobium–zirconium alloys
See Niobium–uranium–zirconium alloys.

Uranium–niobium–zirconium alloys (clad)
See Niobium–uranium–zirconium alloys (clad).

Uranium nitrate–butyl phosphate–kerosene systems
See Butyl phosphate–kerosene–uranium nitrate systems.

Uranium nitrates

(See also Uranyl nitrates.)

conversion to UO_3 by spray calcining, 11: 8408

corrosive effects on Al, 11: 186

determination of hexahydrate, in hexone, 11: 7439

physical properties of, used in TBP process, 11: 8365

separation from Th nitrates by ion exchange, 11: 4372

Uranium nitrides

(See also specific systems which contain nitrogen and uranium.)

properties of interest for use as refractory fuels, 11: 812

Uranium–nitrogen systems
See Nitrogen–uranium systems.

Uranium ore processing plants

(See also Mallinckrodt Process; Slurex Process.)

analytical methods manual, 11: 5206

cost estimates and process economics recommended by AEC, 11: 5306

cost factors for U production by electroreduction of UO_3, 11: 7383

cost factors of, for processing leached zone ore, 11: 4364

design considerations for Alkaline Leach Filtration Pilot Plant, 11: 6684

evaluation of sampling procedures, 11: 7670

flowsheet, 11: 13031

Uranium ore processing plants (cont'd)

flowsheets for La Sal ores, 11: 1022

operation, 11: 5266

potential health hazards and control, 11: 56(J)

process wastes, precipitation and solid removal from, 11: 190(J)

radioassay of ore pulps, γ and β counters for continuous, 11: 7583

for resin-in-pulp process, 11: 6300(J)

testing of Todilto black limestone ore, 11: 3761

Uranium ore slimes

amine extraction studies with various ores and extractant diluents, 11: 979(R)

floatability, 11: 6237(R)

solvent extraction in Amex and Dapex Processes, equipment testing, 11: 980(R)

solvent extraction in Dapex Process, 11: 2859(R)

solvent extraction with alkyl phosphoric acids, 11: 978, 2858

Uranium ores

(See also Uranium concentrates; Uranium minerals.)

acid digestion using dilute acids, 11: 9726

acid leach resin-in-pulp pilot plant testing of Monticello blend, 11: 7147

acid leaching, 11: 2361, 2380(R), 2859(R), 3363, 4367, 5265, 6296, 7146, 8873, 9628(R)

acid leaching for U recovery from Lehigh Coal and Navigation Co. stockpile, 11: 995

acid leaching of low-grade precipitates from Rand Ores, 11: 2351

acid leaching of Marysvale-type, 11: 2363(R)

acid leaching process for low-grade, 11: 7016(P)

activation analysis for U, 11: 5778

amenability tests, acid and carbonate leaching, and processing, 11: 8872

amenability tests and acid and carbonate leaching, 11: 12708

analysis for soluble salts, 11: 10808

analysis for U, use of ion exchange resins, 11: 4293(J)

assaying pulps, γ and β counters for, 11: 7583

beneficiation by scrubbing and desliming, 11: 2347

carbonate leaching, 11: 996, 2352, 3363, 3761, 4367, 5265, 5266, 7470(R), 8879(J), 11967

carbonate leaching, effect of atmosphere and pressure on, 11: 12707

carbonate leaching, high pressure, 11: 10836(R), 12965(R)

carbonate leaching, sampling, and photometric analysis, 11: 12405(R)

carbonate leaching of, use of oxidants in, 11: 11980

carbonate leaching, use of O_2 and CO_2 for better oxidation, 11: 11497(P)

cation exchange of Rand leach solutions, 11: 2350

chemical analysis, 11: 5206

colorimetric analysis for U, 11: 4295(J), 4297(J)

concentration of U before processing, 11: 5819(J)

cyclic leaching, effect of recirculation of pregnant solution on, 11: 7584

development in Australia, 11: 56(J)

direct leaching with organic solvent–HNO_3 mixture, 11: 13015

distribution of leachable U in, from Big Indian Wash Area, San Juan Co., Utah, 11: 12736(J)

extraction of U from, evaluation of solvents for, 11: 7555

flotation, 11: 2380(R)

flotation, gravity concentration, and grinding, 11: 7971

Uranium ores (cont'd)
flotation and U separation, 11: 7192(R)
fluorination process for refining, 11: 9581(R)
fractionation, leaching, and flotation, 11: 7537(R)
gravimetric analysis of AAA for Cl, 11: 2400
grinding, 11: 996, 2303, 6296, 7146, 7147, 8873
grinding, U separation by flotation process, 11: 10478(R), 10479(R)
hydrofluorination of Belgian Congo, 11: 11661
infinite multiplication constant and age, 11: 2881(J)
ion exchange processing, 11: 7507(R)
isotopic abundance of U^{235}, U^{238}, and Ra activity ratios in Colorado Plateau U ores, comparison of, 11: 5867(J)
leaching, 11: 7473(R)
leaching, atmospheric vs pressure, 11: 8878(J)
leaching, beta monitoring of, 11: 2349
leaching for U and V recovery, 11: 1018(R)
leaching with SO_2 in aqueous Fe^{3+} or Mn, 11: 5706
location, types of minerals containing, and extraction methods, 11: 3408(J), 6316(J)
nonaqueous extraction methods for U and V recovery from, 11: 977
occurrence in Blue Bird Claims, Lincoln Co., Nev., 11: 4863
occurrence in Italy, 11: 12039(J)
organic leaching, 11: 8864, 9628(R), 9676(R), 13031
particle sorting by degree of radioactivity, 11: 5100(P)
pilot plant processing of African, for U recovery, 11: 12383
price estimates, 11: 224(J)
processing, 11: 10481
processing, buildup of U in carbonate leach liquors, 11: 2405
processing, comparison of methods, 11: 4364
processing, innovations in, 11: 1809
processing by solvent extraction with amines and alkyl phosphoric acids, 11: 980(R)
processing for uraninite concentration, evaluation of methods, 11: 8871(R)
processing for U and V recovery, 11: 2359
processing for U recovery, 11: 1815(R), 3367(J), 5287(J), 11655(R), 12707
processing for U recovery by ion exchange, 11: 12705
processing in Alkaline Leach Filtration Pilot Plant, 11: 6684
processing in Excer process, 11: 7512
processing in Higgins contactor of Utex mine mill pulp, 11: 13644(R)
processing in resin-in-pulp process, 11: 6296, 6300(J)
processing of Chattanooga uraniferous black shale, 11: 9273(J)
processing of Dysart, 11: 9257
processing of La Sal, 11: 1022
processing of low-grade Western, by countercurrent ion exchange, 11: 189(J)
processing with HCl and acetone, 11: 11517(P)
prospecting, mining, and processing, 11: 7(J)
radiometric analysis for Ra, 11: 5781
radiometric analysis for U with β counter, 11: 13603
recovery of U from monazite sands, 11: 12360(R)
reserves in S. Africa, 11: 9909(J)
roasting, 11: 2859(R)
sampling, evaluation of procedures, 11: 7670
scrubbing to remove surface stains or cements, 11: 2346
slurry processing, 11: 183
solvent extraction for U with TBP, 11: 8393
spectrophotometric analysis for U using methyl isobutyl ketone–butyl cellosolve–water medium, 11: 6260(J)
structural control of, in Apache Co. (Ariz.), 11: 4443(J)
survey of minable deposits, 11: 297(J)
temperature of formation, geological determination, 11: 4442(J)
uranium recovery, effects of roasting temperature and leaching time on, 11: 2316(R)
uranium recovery by acid leaching and phosphate precipitation, 11: 2360
uranium recovery from Midnight Mine, 11: 4366
uranium recovery by Dapex Process, 11: 981

Uranium ores (Utah)
occurrence in Mi Vida deposits, 11: 1084(J)

Uranium–osmium alloys
See Osmium–uranium alloys.

Uranium oxalates
electrolysis for U recovery, 11: 5083(P), 5984(P)

Uranium oxide–aluminum compacts
See Aluminum–uranium oxide compacts.

Uranium oxide–beryllium oxide systems
See Beryllium oxide–uranium oxide systems.

Uranium(IV) oxide–beryllium oxide systems
See Beryllium oxide–uranium(IV) oxide systems.

Uranium oxide–ceramic systems
See Ceramic–uranium oxide systems.

Uranium oxide–cerium oxide systems
See Cerium oxide–uranium oxide systems.

Uranium oxide compacts
corrosion behavior, effects of C and Si impurities on, 11: 13189(R)
preparation of high-density, 11: 9714

Uranium(IV) oxide compacts
cylindrical, fabrication by cold pressing and sintering, 11: 13739
preparation, corrosion by H_2O, chemical reactions with Zr, and radiation effects, 11: 8720(R)
preparation and density, 11: 7898
preparation for microscopic examination, 11: 3428
temperature distribution calculation in swaged, 11: 9101

Uranium(IV) oxide–copper compacts
See Copper–uranium(IV) oxide compacts.

Uranium oxide crystals
formation and structure, 11: 7770

Uranium(IV) oxide crystals
preparation, 11: 4831

Uranium oxide films
preparation by vacuum evaporation, 11: 3007

Uranium oxide–graphite systems
See Graphite–uranium oxide systems.

Uranium(IV) oxide–graphite systems
See Graphite–uranium(IV) oxide systems.

Uranium oxide–lithium carbonate systems
See Lithium carbonate–uranium oxide systems.

Uranium oxide–magnesium oxide systems
See Magnesium oxide–uranium oxide systems.

Uranium oxide–molybdenum compacts
See Molybdenum–uranium oxide compacts.

Uranium oxide–niobium oxide systems
See Niobium oxide–uranium oxide systems.

Uranium oxide–phosphoric acid systems
See Phosphoric acid–uranium oxide systems.

Uranium(VI) oxide–phosphoric acid systems
See Phosphoric acid–uranium(VI) oxide systems.

Uranium oxide–plutonium oxide systems
See Plutonium oxide–uranium oxide systems.

Uranium oxide powders
microscopic study of, 11: 11664
surface area and density, 11: 13189(R)

Uranium(IV) oxide powders
density and surface area measurements, 11: 8720(R)
dispersion, 11: 8514(R)
extrusion, 11: 7898
lattice parameters and crystallite sizes, 11: 13820
particle size measurement in NaK by radioactivation, 11: 8845(J)
preparation, 11: 7898, 8514(R), 12000(R), 12437, 13707
pressing and sintering for fabrication of UO_2 cylindrical compacts, 11: 13739
properties, 11: 7898, 12000(R), 12437
radiation effects, 11: 12437
sieve analysis and flow rate tests, 11: 8719(R)
sintering, 11: 12000(R), 12437
swaging into fuel element cores, 11: 9101

Uranium(VI) oxide powders
x-ray and optical properties, 11: 7898

Uranium(IV) oxide–silicon carbide systems
See Silicon carbide–uranium(IV) oxide systems.

Uranium oxide–silicon compacts
See Silicon–uranium oxide compacts.

Uranium oxide–silicon oxide systems
See Silicon oxide–uranium oxide systems.

Uranium oxide slurries
density vs. temperature and concentration, 11: 2878
flow characteristics, 11: 1036
irradiation in NRX Reactor, 11: 4165
oxidation of aqueous, by H_2O_2, 11: 2369
particle size and form, effect of high pressure and temperature on, 11: 11654
particle size distribution in NaK, heat effects, 11: 11564(R)
particle size measurement, 11: 11802
preparation, 11: 7428(R), 7716, 11802
properties, 11: 7716
properties of NaK-, for reactors, 11: 13516(J)
stability, chemical and dimensional, 11: 7428(R), 11802

Uranium(VI) oxide slurries
critical mass studies, 11: 9865
flow characteristics, 11: 7858(R)
phase studies, and radiation effects, 11: 8707(R)
preparation and chemical stability, 11: 12584(R)
properties, 11: 8707(R), 10810(R), 13982(R)

Uranium(IV) oxide–stainless steel compacts (stainless steel clad)
See Stainless steel–uranium(IV) oxide compacts (stainless steel clad).

Uranium oxide–stainless steel systems
See Stainless steel–uranium oxide systems.

Uranium(IV) oxide–stainless steel systems
See Stainless steel–uranium(IV) oxide systems.

Uranium(VI) oxide–sulfur trioxide–water systems
See Sulfur trioxide–uranium(VI) oxide–water systems.

Uranium oxide–thorium oxide slurries
See Thorium oxide–uranium oxide slurries.

Uranium oxide–thorium oxide systems
See Thorium oxide–uranium oxide systems.

Uranium oxide–titanium oxide systems
See Titanium oxide–uranium oxide systems.

Uranium(IV) oxide–uranium(IV) fluoride systems
See Uranium(IV) fluoride–uranium(IV) oxide systems.

Uranium(VI) oxide–uranyl sulfate–water systems
phase studies, 11: 8282(R)

Uranium(VI) oxide–water systems
crystal structure, 11: 221(J)
mixing and extrusion, 11: 12334
phase studies from 180 to 280°C, 11: 6309

Uranium oxide–yttrium oxide systems
crystallography, x-ray powder study, 11: 13304(J)

Uranium oxide–zirconium oxide systems
density, fabrication, melting point, oxidation, and thermal shock, 11: 1064
physical properties, 11: 7601
sintering, 11: 7601, 12000(R)

Uranium oxide–zirconium systems
chemical reactions, 11: 12317(R)
extrusion techniques for, 11: 7328(R)
interfacial reactions of sandwich-type fuel elements, 11: 11914
phase studies, 11: 7639
radiation effects, 11: 8462(R)
reaction kinetics, 11: 7638
thermal expansion from 0 to 400°C, 11: 9743

Uranium oxides
activation analysis, 11: 12508(R)
casting, 11: 8487(R)
chemical analysis, 11: 5206
chemical determination, 11: 12429(R)
chemical properties, poor conversions in reducing UO_3 to UO_2, 11: 13701
chlorination, 11: 10034
coating with ductile materials, 11: 13763(R)
corrosion, 11: 7601
corrosion by degasses H_2O and steam, 11: 8715(R)
criticality calculations of spheres, 11: 2770
crystal structure, 11: 105, 7899
discovery and properties of hydrous, hydropitchblende, and urgite, 11: 819(J)
electric conductivity and thermoelectric properties, 11: 1710
erosion testing, 11: 12608(R)
fabrication of pellets, 11: 9601
fabrication techniques, 11: 10987(R)
fission gases released from, 11: 7384
fluorination, 11: 5283, 9267, 10847, 10849, 11563(R), 13036

Uranium oxides (cont'd)
fluorination to prepare UF_6, 11: 8425
fluorination to UO_2F_2 by HF treatment, 11: 2376
fuel element fabrication, 11: 13782(R)
gravimetric analysis, 11: 2386
high-temperature reactions of UO_2 and low-temperature reactions of UO_3, 11: 13088
melting point test capsules, 11: 10896
neutron resonance escape probability and effective resonance integral, 11: 1616
oxidation, kinetic study, 11: 10050(J)
phase studies, 11: 7858(R), 13633(R)
photometric analysis for U, 11: 11583
preparation, 11: 7428(R), 7899
preparation by reduction of $UO_2C_2O_4$, 11: 9578(R)
preparation of U_3O_7 by thermal decomposition of $UO_4 \cdot 2H_2O$, 11: 11143(J)
preparation of UO_{3-x} and UO, 11: 5825
properties, 11: 7428(R), 7899, 9863(R), 13782(R)
purification by a solvent extraction and 2 precipitations, 11: 6996(P)
purification using diethyl ether extraction and H_2O_2 precipitation, 11: 2386
quality control analysis of several lots, 11: 12423
radiation damage in APPR fuel plates of, 11: 12540
radiation effects, 11: 12608(R), 13724
reactivity, effect of ring tamping, 11: 13859
reduction, 11: 11703(R)
reduction for preparation of uranium hydride, 11: 2399(R)
reduction with CaH_2 for production of uranium hydrides, 11: 12428(R)
sinterability of, factors affecting, 11: 13189(R)
sintering, 11: 12608(R)
solubility, 11: 7708(R)
stability, 11: 7716, 12608(R), 13189(R)
structure, 11: 13189(R)
technology and potentialities as reactor material, 11: 5080(J)
thermal conductivity, 11: 12608(R)
thermal fracture resistance, 11: 7601
uranium–oxygen atomic ratio in, 11: 105
vapor-phase chlorination, 11: 13027(R)
Uranium oxides (clad)
dimensional stability, effect of radiation on, fabrication, 11: 11012
radiation stability and corrosion during PWR operation, 11: 8712
resonance absorption of neutrons in cylinders, 11: 10335(J)
thermal cycling, 11: 13189(R)
Uranium oxides (stainless steel clad)
fabrication and properties, 11: 13077
Uranium oxides (Zr alloy clad)
dissolution by boiling H_2SO_4, 11: 13653(R)
fabrication of PWR breeder elements, 11: 9108
fretting wear, 11: 3400
radiation effects on PWR breeder elements, 11: 9108
Uranium(IV) oxides
(See also specific systems which contain oxygen and uranium.)
bibliography containing 104 references, 11: 10507(J)
bibliography on, 11: 814
Uranium(IV) oxides (cont'd)
bibliography on production, 11: 2226
catalytic oxidation in carbonate leach slurries, 11: 1021
chemical properties, 11: 6909(R), 12437
chemical reaction with Al, 11: 4451
chemical reaction with O_2 and diffusibility to O_2, 11: 12000(R)
corrosion, 11: 2221
corrosion by 650°F water, 11: 8719(R)
corrosion by water, 11: 6909(R), 9109(R)
cracking from thermal cycling, 11: 10901
density, 11: 11012
determination of free, effect of H_3PO_3, 11: 2401
development of fuel elements, 11: 11490
dissolution rate in carbonate leach solutions, effect of oxidants on, 11: 11980
distribution in SIR cooling system after fuel pin failure, 11: 12564
electric conductivity, 11: 12317(R)
electric properties, 11: 12473(R), 13779(R)
electrodeposition on Al, 11: 1838(J)
electrodes in molten chloride electrolytes, 11: 7158(J)
fabrication, 11: 2221, 11012
fission product gases from, 11: 12000(R)
fluorimetric determination in stainless steel, 11: 6257
fluorination, 11: 7407(R), 9636, 9674, 9679(R), 9681(R), 9696
fluorination, for UF_4 production, 11: 9689(R)
fluorination, inhibition of oxidation during, 11: 9682
fluorination, pilot plant studies, 11: 9693(R)
fluorination, process, equipment, and plant description, 11: 12379
fluorination, recovery of excess HF, 11: 12338
fluorination at high temperatures, equilibrium ratio of HF and water in, 11: 12425
fluorination by continuous methods, 11: 12424(R)
fluorination rate with HF, 11: 9271
fluorination to UF_4 in a moving bed reactor, 11: 10810(R)
fluorination with HF at 550°C, 11: 9695
heat of adsorption of O_2 on, at −183°C, 11: 10052(J)
high-temperature drossing of irradiated U with, 11: 5260
hydrofluorination, 11: 9686(R), 9694, 10854, 11565, 13037
hydrofluorination, equipment for, 11: 12405(R)
hydrofluorination rates studies, 11: 13598(R)
hydrofluorination to UF_4, preparation by reduction of UO_3, 11: 12332(R)
in-pile testing, 11: 10737(R), 13820
magnetic properties, 11: 13779(R)
melting point, determination, 11: 6713
metallurgical studies, 11: 6909(R)
neutron-diffraction analysis, 11: 9054(R)
oxidation, 11: 12456(R)
oxidation in air and in storage, 11: 13222
particle size measurement, 11: 6311
particle size measurement with electron microscope, 11: 12953
phase studies, 11: 2221
physical properties, 11: 2221, 7629(R), 8719(R)
powder metallurgy, 11: 9109(R)
preparation, 11: 8719, 13820

Uranium(IV) oxides (cont'd)
preparation and properties for reactor fuel, 11: 9901
preparation by reduction of U_3O_8 and fluorination to UF_4, 11: 13032
preparation of, for PWR fuel elements, 11: 9714
preparation of large particles, 11: 12456(R)
production, 11: 9646(R), 9694
production by hydrogen reduction of UO_3, 11: 8403
production by reduction of UO_3 with gases, 11: 13034
production by reduction of UO_3 with natural and artificial gas, 11: 12430
properties, 11: 10507(J)
quality effect of structure and N_2 content on, 11: 12000(R)
radiation effects, 11: 6909(R), 7629(R), 9108, 9109(R), 11806(R), 12000(R), 13705
reaction with HF to produce UF_4, 11: 11663
reduction, 11: 7673(R), 9636, 9745(R)
reduction in a H-N atmosphere, 11: 9684
reduction of, by CaH_2, 11: 12429(R)
reduction to U hydride, 11: 13702
shotgun analysis sampling and extraction procedures, 11: 9597
sintering, 11: 10988(R), 12473(R)
sintering, effect of UO_3 pretreatment on, 11: 13779(R)
sintering, effects of additives and methods of preparation on, 11: 8754
solvent partition on Dowex in H_2SO_4, 11: 8288(R)
spectrographic analyses for B, 11: 10855
stability at high temperatures and pressures, 11: 8715(R)
stability in water, 11: 9109(R), 10988(R)
storage, deterioration during, 11: 9699
surface area measurements, 11: 6311
suspension in NaK as reactor slurry, studies in loops to 600°C, 11: 10314(J)
technology, 11: 683(J)
temperature effects, 11: 9108
thermal conductivity, 11: 1709
thermal expansion from 0 to 400°C, 11: 9743
thermal properties, irradiation program proposal, 11: 12421
thermodynamic properties and vaporization processes, 11: 2880(J)
zirconium clad, interfacial reactions, 11: 11914

Uranium(IV-VI) oxides
analysis for trace impurities, 11: 1772
carbonate leaching, 11: 2393
catalytic oxidation in carbonate leach slurries, 11: 1021
chain reaction in spheres of, 11: 9055(J)
fluorination to UF_6 with F_2, 11: 2370
fluorination with anhydrous HF, 11: 9683
preparation of uranyl nitrate from, 11: 7582
price estimates, 11: 224(J)
processing plant for recovery from waste, 11: 12377
purification and ion exchange in scrap recovery processes, 11: 9632(R)
recovery from wastes by sulfuric acid leach-ion exchange process, 11: 12377
reduction to UO_2, 11: 13032
spectral determination of Cd, Zn, Tl, Sb, Bi, Ni, Ba, Na, and K by evaporation in, 11: 7119(J)
spectrochemical analysis for trace elements, 11: 2387
spectrographic analysis, 11: 9235(J)

Uranium(IV-VI) oxides (cont'd)
spectrographic analysis for B, 11: 10855
spectrographic analysis for U^{235}, 11: 10816
spectrophotometric determination in ore slurries, 11: 10812(R)
volumetric assay, interfering elements in, 11: 9697

Uranium(VI) oxides
boron removal, 11: 13599(R)
chemical properties of samples produced by 3 different plants, 11: 12317(R)
chemical reactivity determination, 11: 6258(R)
chemistry of, 11: 7857(R)
crystal structure, 11: 8707(R), 11802, 13982(R)
decomposition in air, 11: 12317(R)
dehydration, 11: 10854
from denitration, reduction to UO_2, 11: 8412
electrodialysis, 11: 11648
electroreduction for U production, 11: 7383
fabrication into pellets, techniques for, 11: 10810(R)
fluorination, effect of temperature, 11: 9580(R)
fluorination in moving bed reactor process, 11: 10858(R)
fluorination rates and equilibrium, 11: 9678
fluorination to UF_4 in moving bed reactors, 11: 7507(R)
hydration rates for, 11: 13598(R)
hydrofluorination, 11: 11565
hydrofluorination and fluorination to UF_6, 11: 3219(P)
ignition loss test for purified, 11: 12433
nephelometric analysis for sulfates, 11: 6258(R)
particle size distribution in platelets of, 11: 11654
phase studies, 11: 9869(R)
preparation, 11: 8707(R), 11565, 11802
preparation by denitration of uranyl nitrate hydrate, 11: 13026
preparation by spray calcining of UNH, 11: 8408
preparation from uranyl nitrate solutions, 11: 9677
production by calcination of uranyl peroxide, 11: 9675
production by conversion of UNH, 11: 11999
production by thermal decomposition of $UO_2(NO_3)_2$, 11: 8403, 9680
production by thermal decomposition of UNH, flowsheets, 11: 8417
production from $UO_2(NO_3)_2$ in fluidized bed reactor, 11: 13581(R)
production of pellets for fluorination to UF_4, 11: 10814(R)
radiation effects, 11: 7857(R)
reactivity, 11: 1429(R)
reduction, 11: 7407(R), 9694, 10854
reduction, cracked ammonia consumption efficiency in, 11: 9698
reduction, using starch as reducing agent, 11: 10502
reduction by NH_3, 11: 9685, 10856
reduction by NH_3 in fluidized bed, 11: 7408(R)
reduction by H_2, 11: 10811(R), 10854, 12473(R)
reduction-fluorination, FMPC pilot-plant tests for, 11: 8413
reduction of, for preparation of UO_2, properties, 11: 7898
reduction to UO_2, 11: 10810(R), 12332(R)
reduction to UO_2, moving bed, 11: 13598(R)
reduction to UO_2 by natural and artificial gas, 11: 12430

Uranium(VI) oxides (cont'd)
reduction to UO_2 with gases, 11: 13034
reduction with H_2-N_2 and H_2-H_2O at 550 to 650°C, 11: 10858(R)
solubility, 11: 11707(R), 12585(R)
solubility in phosphoric acid, 11: 1837
solubility in uranyl solutions at elevated temperatures, 11: 8284(R)
solubility in water, 11: 13982(R)
solubility in H_2O at 150 to 250°C, 11: 8286(R)
spectrophotometric analysis for nitrates, 11: 10812(R)
thermal decomposition to U_3O_8, rate studies, 11: 13598(R)
thermal decomposition, 11: 9687, 13577(R)
Uranium(IV) oxybromides
heat capacity and thermodynamic functions from 10 to 350°K, 11: 220(J)
Uranium(VI) oxybromides
See Uranyl bromides.
Uranium(IV) oxychlorides
heat capacity and thermodynamic functions from 10 to 350°K, 11: 220(J)
Uranium(VI) oxychlorides
See Uranyl chlorides.
Uranium(VI) oxyfluorides
See Uranyl fluorides.
Uranium–oxygen systems
See Oxygen–uranium systems.
Uranium–palladium alloys
See Palladium–uranium alloys.
Uranium perchlorates
activity coefficients in aqueous solutions, 11: 12339(R)
oxidation in air at room temperatures, 11: 2392
Uranium peroxides
analysis for trace impurities, 11: 1772
calcination for production of UO_3, 11: 9675
dye works process for preparation from N. G. solutions, 11: 13010
precipitation from alpha gunks, 11: 2388(R)
precipitation from UO_2SO_4 solutions, 11: 12966(R)
precipitation in HRT fuel solution, 11: 7859(R), 8620
preparation by Chambers Works Process, 11: 13009
preparation from UF_4 by $Al(NO_3)_3$ method, 11: 2373
preparation of cakes from dilute feeds, 11: 10850
production from aqueous UO_2SO_4 containing Mg^{2+} and F^-, 11: 3242(P)
production from UO_2SO_4 by H_2O_2, 11: 13689
recovery from dilute aqueous solutions containing Fe, 11: 6995(P)
solubility in uranyl fluoride solutions, 11: 7456(R), 13691
thermal decomposition in temperature range 90 to 195°, 11: 11143(J)
treatment for removal of fluoride impurities, 11: 3223(P)
Uranium phosphates
complex formation in acid solutions, 11: 11655(R)
melting points in air, 11: 13088
spectrophotometric study of complex formation, 11: 3759
Uranium(IV) phosphates
chemical properties, 11: 11647(R)
precipitation, conditions for, 11: 6696(J)
Uranium–platinum alloys
See Platinum–uranium alloys.
Uranium–platinum metal alloys
See Platinum metal–uranium alloys.
Uranium–plutonium alloys
See Plutonium–uranium alloys.
Uranium–plutonium–water systems
See Plutonium–uranium–water systems.
Uranium powders
explosive limits, handling, safety, and toxicology, 11: 6741
hot pressing, 11: 7685
pressing into slugs, 11: 12435
preparation by reduction of UO_2, 11: 7673(R)
preparation of spherical particles, 11: 9739
preparation of spherical particles by Ca reduction of UO_3, 11: 13087
pressing, 11: 13803
production of high-purity, 11: 7156(J)
pyrophoricity, 11: 7654(R)
pyrophoricity inhibition by addition of paraffin wax or oil, 11: 12435
vacuum-pressing at 600°C, 11: 12497
Uranium precipitates
See Uranium leach precipitates.
Uranium processing plants
See Mallinckrodt Process; Uranium ore processing plants.
Uranium Production Reactor
breeding and fuel element fabrication, 11: 12580
control, 11: 13970
control system, instrumentation, and operating procedure for start-up 11: 9857
conversion ratios of flattened and uniformly loaded cores, comparison, 11: 9852, 13975
core geometry, effect on conversion ratio, 11: 8700
criticality calculations for, 11: 8702, 13977
criticality calculations on mockup, 11: 13976
design data, 11: 7852
design development, 11: 13966(R)
heat generation in thermal shield and concrete, 11: 12581
heat production, distribution of, 11: 9855
loading schedule and control requirements, 11: 9902
mock-up, neutron flux distribution, 11: 12582
mockup design, 11: 13175
neutron flux calculations, 11: 9853, 12578
neutron flux distribution and group theory, 11: 8703
neutron flux distribution in mock-up, 11: 7844(R), 12579
neutron flux distribution in two core structures, 11: 13974
neutron flux measurements, use of thorium oxide foils for, 11: 10909
neutron flux measurements in core mockup, 11: 8690
non-uniform lateral neutron flux effect on total power, 11: 9854
shim rod design revision, 11: 8704
specific activity and shielding requirements for primary coolant circuit, 11: 9856
start-up, calculation of accident hazards, 11: 9857
subcritical mockup, description, and specifications, 11: 8701
thermal expansion of flat fuel plates, 11: 7851
thorium breeder assembly design, 11: 13973
water flow required after shutdown, 11: 13174

Uranium reserves (Japan)

estimation of amount, 11: 1872(J)

Uranium reserves (N. C.)

occurrence in Sandy Run Creek Area, 11: 4436

Uranium–rhodium alloys
See Rhodium–uranium alloys.

Uranium–ruthenium alloys
See Ruthenium–uranium alloys.

Uranium salts

critical mass of solutions of, in Pyrex vessels, 11: 14039

radiochemical analysis for Ba^{140} in nonirradiated, 11: 4396

Uranium(IV) salts

oxidation in air at room temperatures, 11: 2392

production of low solubility derivatives by rongalite, 11: 7157(J)

Uranium selenides

crystallography and phase transitions, 11: 13303(J)

Uranium silicates

(See also Uranium minerals; Uranium ores; and specific uranium minerals.)

discovery and properties of nenadkevite, 11: 818(J)

Uranium silicides

(See also specific systems which contain silicon and uranium.)

deposition on metals using NaK bath, 11: 4464(R)

oxidation and thermal expansion, 11: 12473(R)

properties of interest for use as refractory fuels, 11: 812

thermal expansion coefficients for beta USi_2, 11: 2882(J)

Uranium silicides (Zr alloy clad)

corrosion and diffusion, x-ray study, 11: 8540

Uranium–silicon compacts
See Silicon–uranium compacts.

Uranium–silicon systems
See Silicon–uranium systems.

Uranium–silicon systems (clad)
See Silicon–uranium systems (clad).

Uranium–silicon systems (Zr clad)
See Silicon–uranium systems (Zr clad).

Uranium–silver alloys
See Silver–uranium alloys.

Uranium slurries

corrosive effects on babbitt- and silver-impregnated graphite, 11: 13742

preparation and properties, 11: 13486

solvent extraction of, with TBP for reactor grade U, 11: 5287(J)

uranium recovery by char-in-pulp process, 11: 6683

Uranium–stainless steel couples
See Stainless steel–uranium couples.

Uranium sulfates

preparation by reaction of UF_6 and H_2SO_4, 11: 10495, 11496(P)

Uranium(IV) sulfates

oxidation in air at room temperatures, 11: 2392

preparation, 11: 12432

preparation by reduction of UO_2SO_4, 11: 12431

preparation from UO_3 or UO_2 and H_2SO_4, 11: 2389

Uranium sulfides

lattice dimensions and density of U_2S_3, 11: 8543(R)

properties of interest for use as refractory fuels, 11: 812

Uranium systems

physical properties of fuel compounds, 11: 6713

Uranium–tantalum alloys
See Tantalum–uranium alloys.

Uranium–tantalum–tungsten alloys
See Tantalum–tungsten–uranium alloys.

Uranium–tantalum–zirconium alloys
See Tantalum–uranium–zirconium alloys.

Uranium–thorium alloys
See Thorium–uranium alloys.

Uranium–thorium alloys (clad)
See Thorium–uranium alloys (clad).

Uranium–thorium couples
See Thorium–uranium couples.

Uranium–tin–zirconium alloys
See Tin–uranium–zirconium alloys.

Uranium–titanium alloys
See Titanium–uranium alloys.

Uranium–titanium–zirconium alloys
See Titanium–uranium–zirconium alloys.

Uranium–tungsten alloys
See Tungsten–uranium alloys.

Uranium–vanadium alloys

analysis for V, 11: 13606

casting and fabrication, 11: 13766

corrosion, 11: 7663(R)

equilibrium diagram and hardness, 11: 13771

Uranium–vanadium sandstone deposits (Ariz.)

occurrence in Cameron area, 11: 10083

Uranium–vanadium sandstone deposits (Colo.)

occurrence in Bitter Creek Group, 11: 4445(J)

Uranium–vanadium sandstone deposits (Mont.)

exploration, 11: 4435

Uranium–vanadium sandstone deposits (Utah)

occurrence in Mi Vida mine, 11: 1084(J)

Uranium–vanadium sandstone deposits (Wyo.)

occurrence in Browns Park Formation, 11: 4433

Uranium–water systems

buckling measurements and calculations, 11: 5493(R)

buckling of thermal neutrons in square matrices, 11: 10972

critical enrichment, 11: 2116(R)

criticality of spherical, 11: 11008

exponential measurements, 11: 8116(R)

fast fission factor calculations for, 11: 9872

fission cross sections of Pu^{239} and U^{235} in lattices, 11: 622(J)

neutron production in, effects of reflector material and lattice thickness on, 11: 9881

neutron slowing down, 11: 545(J)

plutonium^{239} breeding ratio, 11: 678(J)

resonance capture, 11: 6094

Uranium–zinc alloys

crystal structure of U_2Zn_{17}, 11: 12778(J)

liquidus composition and preparation, 11: 13794(R)

phase studies, 11: 7676(R), 7677(R)

phase studies, effects of temperature on, 11: 7673(R)

preparation, 11: 11704(R)

Uranium–zinc alloys (liquid)
static corrosion of metals by, 11: 9747
Uranium–zirconium alloys
aging characteristics, 11: 13794(R)
analysis of, studied by autoradiography, 11: 1892(J)
annealing, post-irradiation, 11: 9741
bonding to Sn–Zr alloys, 11: 13775
casting, 11: 11688(R)
casting fuel assemblies, 11: 13806(R)
centrifugal casting, grain size, 11: 764f
centrifugal casting of, equipment and methods, 11: 7723
chemical analysis, 11: 13607
chemical reactions with water at high temperatures, 11: 14003
chlorination, 11: 7410
chlorination, heat transfer problems in, 11: 12321(R)
chlorination rate from 528 to 680°C, 11: 12965(R)
chlorination rate in Zircex Process, 11: 7139(R)
cladding, 11: 8715(R), 13771
colorimetric analysis for B, 11: 1774
colorimetric analysis for Pt, 11: 3698
constitution diagrams, 11: 1163(J), 7639, 12954, 13805(R)
corrosion, 11: 7639, 7663(R), 8926 11744(R), 12317(R), 12473(R), 13741, 13782(R)
corrosion, effect of heat treatment on, 11: 6351
corrosion by biphenyl, 11: 5310
corrosion by high-temperature water, 11: 1868, 4860, 8443, 9711(R), 13755
corrosion by water, 11: 6718, 9286, 11693, 11747(R), 13052, 13779(R), 13868(R)
corrosion by water at 100°C, 11: 12499(R)
corrosion resistance, 11: 11716
corrosion resistance, effects of heat treatment, 11: 9717
creep strength at 1500 to 1800°F, 11: 12630
decontamination by high-temperature processes, 11: 7543(R)
deformation during in-pile cycling, 11: 9834
density, effects of radiation on, 11: 11688(R)
diffusion, 11: 13771
diffusion, autoradiographic analysis, 11: 1892(J), 11232(J)
diffusion in γ phase, evidence of Kirkendall effect in, 11: 11230(J)
dimensional stability, 11: 8687(R)
dimensional stability, effects of radiation on, 11: 8719(R), 11688(R)
dimensional stability, effects of thermal cycling on, 11: 7681(R)
dissolution, 11: 7509(R)
dissolution, separation, and acid leaching of U, 11: 8424
dissolution in aqua regia, 11: 13652(R)
dissolution in fused salt, 11: 8387(R)
dissolution in fused $NaF-ZrF_4$, 11: 9580(R)
dissolution in $HNO_3-HF-Al(NO_3)_3$, 11: 13580(R)
dissolution in H_2SO_4-HF system, 11: 11969
equilibrium diagram, 11: 13771
explosive reactions with H_2O at high temperatures, 11: 2511
extrusion, 11: 11711(R)
extrusion constant determination, 11: 8524(R)
fabrication, 11: 7626(R), 7639, 8717(R), 11744, 13741
fabrication of "radiator" type fuel elements, 11: 11710(R)
Uranium–zirconium alloys (cont'd)
fission product permeability, 11: 9741
forging, 11: 8715(R), 9732
hardness, 11: 5702, 13771
hardness, effects of O_2 on, 11: 305
hardness, effect of remelting and fabrication, 11: 13104
hardness at various heat treatments, 11: 12954
heat treatment, 11: 305, 5702, 7626(R), 11693, 11744(R), 12317(R), 13042
hot hardness, 11: 13779(R)
hot-hardness and grain structure, 11: 12317(R)
hot malleability, 11: 3854
hydrochlorination in Zircex Process, 11: 10820(R)
hydrochlorination rates, convection coefficients, and emissivities of, 11: 11053(R)
hydrofluorination, 11: 7410
interdiffusion, 11: 13562
internal and surface defects on Zircaloy 2 and 3 extrusion billet material, 11: 11200
irradiation stability of fuel, 11: 7884
mechanical properties, 11: 11693, 13824
mechanical properties, effect of temperature, 11: 13772
melting, 11: 8715(R), 8717(R)
melting and casting from co-reduced Mallinckrodt biscuit, 11: 7626(R)
melting and fabrication techniques, 11: 10986(R)
metallography of epsilon phase, 11: 3428
microstructure, 11: 305, 5702, 7626(R), 7629(R), 7639, 7681(R), 11693, 12954, 13741
nitric acid dissolution of, identification and characterization of explosive residues produced by, 11: 13694
oxidation and corrosion in O_2 and H_2O, 11: 13817
oxidation at 1 atm pressure at temperature range 200 to 500°C, 11: 5907(J)
phase diagrams of 40 to 60 wt. % Zr, 11: 13088
phase studies, 11: 7626(R), 7629(R), 7673(R), 7676(R), 8518(R), 10887(R) 11689(R), 11693, 13042, 13694
physical properties of low- and high-C, 11: 8470
preparation, 11: 5702, 9732, 13824
production by co-reduction process, 11: 8497, 8528
properties, 11: 7639, 13782(R)
radiation damage, 11: 8319, 9741
radiation effects, 11: 7328(R), 7639, 10736(R)
radiation effects on growth rate, influence of α annealing on, 11: 11689(R)
radiation effects on thermal conductivity, 11: 12622
radiation stability, 11: 12317(R)
recrystallization, 11: 11693
rolling, 11: 9732
slug manufacture from, 11: 11687(R)
stability, 11: 13042
tensile properties, 11: 12473(R), 13100
thermal conductivity, 11: 14031(R)
thermal cycling, 11: 5702, 7626(R), 8518(R), 11747(R)
thermal expansion, 11: 5702, 8518(R)
thermal rupture, 11: 9732
uranium recovery by hydrochlorination, 11: 12402
uranium recovery from, by fluorination, 11: 9638

Uranium–zirconium alloys (cont'd)

Van de Graaff radiography, 11: 2772

volumetric analysis of chemical processing streams for fluorides, 11: 7945

Uranium–zirconium alloys (clad)

defect test in X-2 loop, corrosion, extrusion, rupture, 11: 2899

Uranium–zirconium alloys (liquid)

high-temperature reactions with H_2O, 11: 3834(R), 8916(R)

Uranium–zirconium alloys (Zr alloy clad)

corrosion by water at 600°F and steam at 750°F, 11: 12490(R)

extrusion of fuel rods of, 11: 13810

fabrication, phase studies, heat treatment, and melting, 11: 12490(R)

in-pile testing, 11: 12882

Uranium–zirconium alloys (Zr clad)

dissolution, 11: 14020(R)

dissolution by fused salts, 11: 10820(R)

fabrication and heat treatment, 11: 11715(R)

preparation of rods for heat thru-put test, 11: 9728

Uranium–zirconium compacts

thermal expansion from 0 to 400°C, 11: 9743

Uranium–zirconium couples

diffusion at 1000°C, concentration-penetration curve, 11: 6165(J)

effect of thermal cycling on, 11: 11702(R)

Uranophanes

crystal structure, 11: 5317

Uranothorites

geophysical exploration near Forest Home, Calif., 11: 3829(J)

occurrence in Rock Creek Placer Area, Idaho, 11: 4439

Uranyl acetates

(See also Acetate Separation Process.)

fluorescence and absorption spectra of, 11: 12004(J)

heat of dilution of aqueous solutions, 11: 10505(J)

Uranyl ammonium phosphates

See Ammonium uranyl phosphates.

Uranyl bromides

electrolytic dissociation in water, 11: 6306(J)

fluorescence and absorption spectra of, 11: 12004(J)

Uranyl carbonate slurries

preparation, 11: 8707(R), 13982(R)

properties, 11: 8707(R), 13982(R)

Uranyl carbonates

(See also Sodium uranyl carbonates.)

solubility in alkali carbonates at elevated temperatures, 11: 2363(R)

solubility in Na_2CO_3 solutions, chemical analysis, 11: 2362

sorption on anion exchange resins, 11: 11578(R)

thermal and radiation stabilities of alkaline solutions, 11: 2384

Uranyl chlorides

analysis for B, 11: 940(J)

electrolytic dissociation in water, 11: 6306(J)

electrolytic reduction to uranium chloride, description, 11: 2358

exchange reactions and preparation, 11: 11563(R)

ion exchange properties of solutions of, 11: 12341(R)

preparation by oxidation of UCl_4, 11: 2403

solution partition of, between 30 vol. % TBP in CCl_4 and aqueous HCl, 11: 13580(R)

Uranyl chromate–water systems

chemical properties, 11: 6092

Uranyl complexes

See Uranium complexes.

Uranyl compounds

absorption on orthophosphate and phosphonate polymers, 11: 4373

adsorption of UO_2^{+2} on charcoal from acid solutions, 11: 2364

spectra, isotope effect and other features in, 11: 11826

spectroscopic data, 11: 9670

Uranyl fluoride complexes

dissociation constants, 11: 216(J)

Uranyl fluoride–water systems

chemical properties, 11: 6092

critical dimensions, 11: 8753

criticality studies, 11: 1313, 11006, 11828

criticality studies on cylindrical containers, 11: 1618(R)

phase studies, 11: 8283(R)

Uranyl fluoride–water-d_2 systems

neutron attenuation, 11: 11348

Uranyl fluorides

activity coefficients in aqueous solutions, theory, 11: 11574(R)

chemical reactions, 11: 215

conductivity of solutions, 11: 7857(R), 8284(R), 13691

corrosive effects, 11: 7456(R), 7857(R), 8707(R), 9863(R), 11801(R), 12584(R)

corrosive effects and gas production by pile-irradiated, 11: 12585(R)

corrosive effects on reactor materials, 11: 13982(R)

corrosive effects on stainless steel, Zr, and Ti, 11: 12465(R)

corrosive effects on stainless steel and zirconium, 11: 13057

critical experiments with H_2O reflected spheres of H_2O solutions, 11: 813

critical conditions for, 11: 14038

density of aqueous solution, 11: 8284(R), 13691

electrolytic reduction of, to produce pure UF_4, 11: 12419

electrolytic reduction to UF_4 in Excer Process, 11: 7900

hydration, 11: 13691

physical properties, radiation effects on, 11: 7456(R)

preparation, 11: 215, 13691

Uranyl fluorides (cont'd)
preparation by heating uranyl ammonium phosphate, 11: 11499(P)
preparation by hydrofluorination of U oxides, 11: 2376
production by electrolytic reduction to UF_4, 11: 9673
radiation effects, 11: 12584(R), 13982(R)
solubility, 11: 13691
solvent extraction, 11: 13698(R)
solvent properties, 11: 12584(R), 13691
solvent properties for UO_4, 11: 7456(R)
spectra of, fluorescence and absorption, 11: 12004(J)
sublimation in presence of HF, 11: 9270
thermal reduction, 11: 8411(R)
uranium recovery, effect of dilution on F^- ion, 11: 2379

Uranyl ions
absorption spectra, 11: 6697(J)
apparent molal volume infinitely dilute aqueous solution, 11: 219(J), 10501
chromatographic adsorption on Al_2O_3 from mixtures of $LiNO_3-KNO_3$, 11: 4377(J)
complexes with reductone, spectrophotometric study, 11: 9272(J)
hydrolysis in water, 11: 8885(J)

Uranyl nitrate–butyl phosphate–nitric acid systems
See Butyl phosphate–nitric acid–uranyl nitrate systems.

Uranyl nitrate–ethyl ether–water systems
See Ethyl ether–uranyl nitrate–water systems.

Uranyl nitrate–nitric acid systems
See Nitric acid–uranyl nitrate systems.

Uranyl nitrate–nitric acid–water systems
See Nitric acid–uranyl nitrate–water systems.

Uranyl nitrate–sulfuric acid systems
See Sulfuric acid–uranyl nitrate systems.

Uranyl nitrate–water systems
chemical properties, 11: 6092
criticality in right cylindrical reactors, 11: 11007
densities, equations for finding, 11: 2383
phase studies under irradiation at 400°C and 5000 psi, design of pressure bomb for, 11: 3357(J)
radiolytic yields of H_2 and N_2, 11: 3598(J)

Uranyl nitrates
(See also Rubidium uranyl nitrates.)
with NH_4NO_3 and hexone, heat, partition and density data, 11: 4356
analysis for HNO_3, 11: 8292
analysis for NO_3^- in aqueous and non-aqueous solutions, 11: 6249
analysis for sodium, 11: 7440(R)
anion exchange to UO_2F_2 in Excer Process, 11: 7900
calcination, equipment for, 11: 11999
chemical properties, 11: 12970(R)

Uranyl nitrates (cont'd)
continuous denitration, 11: 7407(R)
corrosive effects, 11: 9863(R), 11801(R)
corrosive effects on bearing materials, 11: 7616
corrosive effects on stainless steels, 11: 8459
crystallization yield in water solutions, 11: 3632(J)
denitration, 11: 8412
denitration of, in a fluidized bed, 11: 13580(R)
denitration of the hydrate, 11: 13026
denitration to UO_3 in fluidized bed reactor, 11: 13581(R)
denitration using cyclone separation, 11: 13582(R)
density and molal volume, pycnometric determination, 11: 219(J), 10501
density and refractory index of solutions, 11: 8279
distribution of B in ether and water phases in solutions, 11: 9688
electrodialysis, 11: 11648
ether extraction in sieve-plate extractor, 11: 13632
evaporation, equipment design for, 11: 984
extraction from $Th(NO_3)_4-HNO_3-Ca(NO_3)_2$ solutions with various organic solvents, 11: 11652
extraction with tributylphosphate, 11: 2868(J)
extraction with TBP–kerosene systems, 11: 11629(R)
fluorination in moving-bed reactors, 11: 11567(R)
fluorination to KUF_5 in sunlight, 11: 2368(R)
fluorination to UF_4 in Excer Process, 11: 9665
gas production from pile-irradiated, 11: 12585(R)
heat of solution, 11: 13633(R)
heats of solution in organic solvents, 11: 13576(R)
hydration in organic solvents, 11: 11146(J)
ion exchange estimation of free HNO_3 in, 11: 5219(J)
ion exchange purification, 11: 9673
physical properties of, used in TBP process, 11: 8365
polarographic determination in Redox solutions, 11: 11621
preparation of, from black oxide, 11: 7582
preparation of UF_4 from, by precipitation, 11: 8418
preparation of uranium trioxide from solutions, 11: 9677
production by treating $UO_4 \cdot 2H_2O$ with HNO_3, 11: 10851
production of crude UNH, flowsheets and equipment for, 11: 12422
production of pure, from impure Na diuranate, 11: 13033
purification by ether-water extractions of crude product, 11: 8428
solubility in water from 70 to 184°C, 11: 12339(R)
solvent extraction, 11: 9632(R), 9634, 13012
solvent extraction by ether from metal nitrate solutions, 11: 11493
solvent extraction with TBP from HNO_3, effect of temperature, 11: 9264(J)
solvent extraction with TBP-kerosene, 11: 9645(R), 9646(R)

Uranyl nitrates (cont'd)

solvent partition between $H_2O-(C_2H_5)_2O$ systems, 11: 2345

solvent partition in butyl phosphate–kerosene systems at low acid concentrations, 11: 212

solvent partition in butyl phosphate–nitric acid systems, 11: 2331

spectrophotometric analysis for U, 11: 185(R)

spray decomposition of solution to UO_3, 11: 11660

thermal conductivity, 11: 8747(R)

thermal decomposition of uranyl nitrate hexahydrate, 11: 9589(R)

thermal decomposition to UO_3, 11: 9680

thermal decomposition to UO_3, flowsheets, 11: 8417

thermolysis, 11: 972(J), 9636

vapor pressure, 11: 12584(R)

Uranyl oxalates

reduction to uranium oxides, 11: 7578(R)

Uranyl phosphate complexes

formation, spectrophotometric analysis, and solvent extraction, 11: 1019

Uranyl phosphate–phosphoric acid systems
See Phosphoric acid–uranyl phosphate systems.

Uranyl phosphates

(See also Ammonium uranyl phosphates; Copper uranyl phosphates.)

chemical properties of aqueous solutions, 11: 2363(R)

reaction with anhydrous hydrogen fluoride, 11: 8429

recovery of U with H_3PO_4, 11: 2326(R)

solubility, 11: 11647(R)

Uranyl selenites

composition of, determination, 11: 201(J)

precipitation from H_2SO_4 and HNO_3, 11: 12299(J)

Uranyl silicates

preparation and chemical properties, 11: 5289

Uranyl sulfate–beryllium sulfate–water systems
See Beryllium sulfate–uranyl sulfate–water systems.

Uranyl sulfate–copper sulfate–sulfuric acid systems
See Copper sulfate–sulfuric acid–uranyl sulfate systems.

Uranyl sulfate–copper sulfate–water systems
See Copper sulfate–uranyl sulfate–water systems.

Uranyl sulfate–nickel sulfate–water systems
See Nickel sulfate–uranyl sulfate–water systems.

Uranyl sulfate–plutonium systems
See Plutonium–uranyl sulfate systems.

Uranyl sulfate–sulfuric acid systems
See Sulfuric acid–uranyl sulfate systems.

Uranyl sulfate–uranium(VI) oxide–water systems
See Uranium(IV) oxide–uranyl sulfate–water systems.

Uranyl sulfate–water systems

chemical properties, 11: 6092

corrosive effects on Pt, Ti, Zr, stainless steel, Sn–Zr, and Ni alloys, 11: 8449

Uranyl sulfate–water systems (cont'd)

corrosive effects on stainless steel and inhibition by Graphitar, 11: 7606

density, viscosity, and surface tension, 11: 213

iodine removal by O_2 stripping, 11: 11638(R)

phase equilibria, effects of H_2SO_4 on, 11: 12339(R)

phase studies, 11: 12330(R)

physical properties, 11: 213, 2878, 7788

purification, 11: 13641

solvent properties for La, Cd, Zn, Y, Cs, Ag, and Ba sulfates, 11: 3777(J)

solvent properties for O_2 from 212 to 325°F, 11: 1017

solvent properties for rare earth sulfates and $SrSO_4$, 11: 8383(R)

volume expansion studies, 11: 7430(R)

Uranyl sulfate–water-d_2 systems

analysis for Al and Cr, 11: 8296(R)

corrosive effects, 11: 6348(R)

corrosive effects on stainless steel, 11: 1863, 3809(R)

density, viscosity, and surface tension, 11: 213

flow and heat transfer characteristics in circular channels, 11: 2429

nuclear properties, 11: 11762

oxygen effects on corrosiveness and D_2-O_2 recombination, 11: 13910

properties, 11: 8707(R)

Uranyl sulfates

activity coefficients for, from vapor pressure measurements, 11: 9587(R)

analysis for corrosion products, 11: 4292(J)

analysis for free acid using an automatic differential titrator, 11: 929

analysis for impurities, 11: 8628

analysis for sulfates, 11: 2332

anion exchange, high-concentration effects and rate studies, 11: 7148(J)

chemical stability, 11: 7858(R), 9863(R), 13982(R)

conductivity of solutions, 11: 7857(R), 8482(R), 12585(R)

corrosive effects, 11: 6536(R), 7858(R), 9863(R), 10531, 10533, 11682(R), 11798(R), 12585(R), 13985(R)

corrosive effects of $UO_2SO_4-U_2SO_4$ systems, 11: 13745

corrosive effects on Al_2O_3 and TiO_2, 11: 12898(R)

corrosive effects on binary and ternary Zr alloys with Cr, Si, Mo, Nb, and V, 11: 12898(R)

corrosive effects on HRE materials and components, 11: 8708(R)

corrosive effects on HRT materials, 11: 3395, 4692(R), 7859(R)

corrosive effects on reactor materials, 11: 8911, 9869(R), 13982(R)

corrosive effects on stainless steel, 11: 6348(R), 6720, 7857(R), 11675, 11677, 13743

corrosive effects on stainless steel, effect of loop history and additions of Cl^-, Br^-, and pertechnetate ions and $BeSO_4$, 11: 12898(R)

corrosive effects on stainless steel, effects of radiation on, 11: 9587(R)

corrosive effects on stainless steel and titanium, 11: 9719

Uranyl sulfates (cont'd)
corrosive effects on stainless steel at 250°C, 11: 7607
corrosive effects on titania and sapphires, 11: 7609
corrosive effects on Ti, stainless steel, and Zircaloy-2, effect of Li_2SO_4, 11: 12463
decomposition, 11: 7858(R)
decontamination, 11: 7835(R), 8381(R), 11632(R), 11633, 11634(R), 11798(R)
decontamination by absorption of fission products, 11: 7836(R)
drying, 11: 7835(R), 13677(R)
drying, apparatus design, 11: 8381(R)
electrolytic dissociation in water, 11: 6306(J)
evaporation of aqueous solutions, effects of corrosion and fission products on, 11: 7417(R)
fission product adsorption from, 11: 7837(R), 9633(R), 11635(R)
gas production from, 11: 7857(R), 12585(R)
high-temperature reactions with active metals, 11: 11697
luminescence, temperature effects, 11: 815(J)
phase studies, 11: 8707(R), 9663(R)
phase studies at elevated temperatures, 11: 9869(R)
physical and chemical properties, and effects of radiation on, 11: 12584(R)
physical properties, 11: 2878
preparation, 11: 11634(R)
preparation from UO_3 or UO_2 and H_2SO_4, 11: 2389
processing, 11: 10292
production, 11: 8381(R), 11798(R), 13676(R)
production from UF_6, 11: 13698(R)
radiation effects, 11: 13982(R)
radiation effects on solutions, 11: 8739
radiation stability, 11: 12585(R)
radiochemical analysis, 11: 8285(R)
radiolysis of aqueous solutions, 11: 12339(R)
rare-earth removal from, calcium fluoride and alternate methods for, 11: 8708(R)
reactions with hydrogen peroxide, kinetics, 11: 8284(R)
recombination, 11: 7858(R)
recovery, 11: 11634(R)
reduction by hydrocarbons, 11: 12704
reduction to $U(SO_4)_2$, 11: 12431
removal of rare earth fission products by CaF_2, 11: 8382(R)
sampling radioactive in HRT, 11: 9468
separation from H_2SO_4 by electrodialysis, 11: 11648
solubility in H_2SO_4, 11: 13698(R)
solubility of Ag_2SO_4, $BaSO_4$, and UO_3 in, 11: 12585(R)
solvent properties, 11: 13641
Uranyl sulfates (cont'd)
solvent properties for H_2WO_4, 11: 7858(R)
spectra of, fluorescence and absorption, 11: 12004(J)
stability, 11: 12970(R)
thermal decomposition during roasting of shale, 11: 2381(R)
thermal expansion, 11: 13985(R)
vapor pressure, 11: 8284(R), 12585(R)
Uranyl vanadates
solubility in Na_2CO_3, 11: 2405
Uravan Mineral Belt (Colo.-Utah)
zoning of deposits in, 11: 4445(J)
Uravan ores
See Carnotites.
Urea
decomposition of substituted, C^{13} effect, 11: 4339(J)
denaturation of irradiated ovalbumin by, 11: 4278(J)
hydrogen atoms positions in, measured by neutron diffraction, 11: 6668(J)
metabolism, effects of total-body irradiation in rats, 11: 5132(R)
Urea, thio-
complexes with La, Ce, Pr, and Nd, 11: 10031(J)
protective effects on protein solutions irradiated by x ray or ultraviolet rays, 11: 1807(J)
radiation effects on aqueous solutions, 11: 11964(J)
Urea, thio-, complexes
physiological effects on rats and mice, 11: 11841(R)
radiosensitivity effects in rats and mice, 11: 11841(R)
radiosensitivity effects on lethal total-body irradiation in dogs, 11: 11876
Uric acid
excretion pattern in rats, effects of irradiation, 11: 42(J)
urinary excretion in x-irradiated-adrenalectomized rats, 11: 10398
Uridine
enzymatic activity of rat tissue toward, effects of total-body x-irradiation, 11: 8779(J)
Uridylic acid
enzymatic activity of rat tissue toward, effects of total-body x-irradiation, 11: 8779(J)
Urine
analysis for Pu, 11: 12659(J)
chemical analysis, sample preparation by ion exchange, 11: 833
chemical analysis for coproporphyrin, 11: 1394
chemical analysis for taurine, 11: 13229(R)
colorimetric analysis for Th using morin, 11: 1445
creatine and creatinine content, from irradiated rats, 11: 3285(J)
creatinine levels in irradiated monkeys, 11: 13241(J)
creatinine levels in rat, effects of irradiation, 11: 12640

Urine (cont'd)

enzymatic activity of desoxyribonuclease in irradiated dog, method of measurement, 11: 9196(J)

radiometric analysis for fission products, 11: 8793(R)

radiometric analysis for Po, 11: 109, 13570

radiometric analysis for Pu, 11: 2243(R), 5214

radiometric analysis for Ra^{226}, 11: 7920(R)

radiometric analysis for Th, 11: 6209(R)

radiometric analysis for tritium, 11: 2243(R), 2273, 2274

radiometric analysis for U, 11: 5779

Utah

geologic map of Agathla Peak NW quadrangle in, 11: 6728(J), 6729(J)

geologic map of Boot Mesa NW Quadrangle in, 11: 6724(J), 6725(J)

nomenclature of upper triassic strata in southeastern, 11: 6723(J)

photogeologic map of Navajo Mountain-13 Quadrangle in Kane and San Juan Counties, 11: 1101(J)

photogeologic map of Orange Cliffs-11 Quadrangle in Garfield and Wayne counties, 11: 1104(J)

photogeologic map of Orderville Canyon NW Quadrangle in Kane and Washington Counties, 11: 1105(J)

photogeologic map of White Canyon-3 Quadrangle in San Juan and Garfield Counties, 11: 1112(J)

photogeologic map of White Canyon-4 Quadrangle in San Juan and Garfield Counties, 11: 1089(J)

preliminary geologic map of Loa 1 NE Quadrangle, 11: 9297(J)

preliminary geologic map of Loa 1 SE Quadrangle, 11: 9298(J)

preliminary geologic map of Loa 4 NE Quadrangle, 11: 9299(J)

preliminary geologic map of Notom 1 SW Quadrangle, 11: 9300(J)

preliminary geologic map of Notom 2 NE Quadrangle, 11: 9301(J)

preliminary geologic map of Notom 2 NW Quadrangle, 11: 9302(J)

preliminary geologic map of Notom 2 SE Quadrangle, 11: 9304(J)

preliminary geologic map of Notom 2 SW Quadrangle, 11: 9303(J)

preliminary geologic map of Notom 3 NE Quadrangle, 11: 9305(J)

preliminary geologic map of Notom 3 NW Quadrangle, 11: 9306(J)

preliminary geologic map of Notom 3 SE Quadrangle, 11: 9308(J)

preliminary geologic map of Notom 3 SW Quadrangle, 11: 9307(J)

preliminary geologic map of Notom 4 NE Quadrangle, 11: 9309(J)

preliminary geologic map of Notom 4 NW Quadrangle, 11: 9310(J)

preliminary geologic map of Notom 4 SE Quadrangle, 11: 9312(J)

preliminary geologic map of Notom 4 SW Quadrangle, 11: 9311(J)

uranium deposits, collected field material on, 11: 6356(R)

uranium occurrence in black shale deposits of, 11: 3409(J)

Utah (Carbon Co.)

photogeologic map of Desert Lake-3 Quadrangle, 11: 9316(J)

Utah (Emery Co.)

photogeologic map of Desert Lake-3 Quadrangle, 11: 9316(J)

photogeologic map of Emery-8 Quadrangle in, 11: 1094(J)

Utah (Emery Co.) (cont'd)

photogeologic map of Tidwell-10 Quadrangle in, 11: 1103(J)

photogeologic map of Tidwell-11 Quadrangle in, 11: 1115(J)

Utah (Garfield Co.)

photogeologic map of Orange Cliffs-13 Quadrangle in, 11: 1095(J)

Utah (Grand Co.)

preliminary geologic map of Polar Mesa Camp District, 11: 10544(J)

Utah (Kane Co.)

photogeologic map of Buckskin Gulch NW Quadrangle, 11: 9319(J)

photogeologic map of Buckskin Gulch SW Quadrangle in, 11: 12043(J)

photogeologic map of Johnson NE Quadrangle in, 11: 12044(J)

photogeologic map of Johnson SE Quadrangle, 11: 9318(J)

Utah (San Juan Co.)

geochemical prospecting in Big Indian Wash Area by use of leachable uranium, 11: 12736(J)

geophysical exploration of Big Buck Mine in, 11: 3819

occurrence of U minerals in, 11: 1084(J)

photogeologic map of Bluff-3 Quadrangle in, 11: 1098(J)

photogeologic map of Carlisle-1 Quadrangle in, 11: 1097(J)

photogeologic map of Mount Peale-4 Quadrangle in, 11: 1090(J)

photogeologic map of Mount Peale-5 Quadrangle, 11: 9313(J)

photogeologic map of Mount Peale-6 Quadrangle (Utah), 11: 1091(J)

photogeologic map of Mount Peale-7 Quadrangle, 11: 1100(J)

photogeologic map of Mount Peale-8 Quadrangle in, 11: 1092(J)

photogeologic map of Mount Peale-12 Quadrangle, 11: 9314(J)

photogeologic map of Mount Peale-13 Quadrangle, 11: 9315(J)

photogeologic map of Mount Peale-16 Quadrangle in, 11: 1093(J)

photogeologic map of Navajo Mountain-1 Quadrangle in, 11: 1117(J)

photogeologic map of Navajo Mountain-8 Quadrangle in, 11: 5869(J)

photogeologic map of Navajo Mountain-10 Quadrangle in, 11: 5323(J)

photogeologic map of Navajo Mountain-14 Quadrangle in, 11: 5324(J)

photogeologic map of Navajo Mountain-15 Quadrangle in, 11: 1102(J)

preliminary geologic map of Mount Peale 1 SE Quadrangle in, 11: 10545(J)

preliminary geologic map of Mount Peale 1 SW Quadrangle in, 11: 10546(J)

Utah (Tooele Co.)

geophysical exploration of Silver King Claims, 11: 6355

Utah (Washington Co.)

photogeologic map of Virgin SE Quadrangle in, 11: 1096(J)

Utah. Univ., Salt Lake City. Radiobiology Lab.

progress reports, 11: 5133(R)

progress reports on toxicology of radioactive heavy metals, 11: 11019(R)

V

V particles
(See also S particles.)
classification, cloud-chamber study, 11: 5997(J)
decay with an electron secondary, 11: 1548(J)
model for unstable, 11: 4965(J)
observations on V° events, 11: 529(J)
production and decay, cloud-chamber study, 11: 3002(J)
properties of long-lived neutral, 11: 5993(J)

Vacuum furnaces
casting and melting of Th in induction-heated, 11: 13101
design and operation, 11: 7407(R)
design and operation of radio frequency heating, 11: 303
design and performance of large vacuum oven, 11: 12022
design for recasting U, 11: 8529
design for study of mechanism and kinetics of carbide formation, 11: 6238(J)
design of high-temperature for gas analysis of metals, 11: 4469
design of U-casting, 11: 9580(R)
internally water cooled micarta-tube-type induction, design, 11: 2530
radiation and thermal shields for, 11: 1903(J)

Vacuum gages
(See also Pressure gages.)
calibration, design of primary standard for, 11: 2565
design of thermionic ionization, 11: 9569(P)
design using photoelectric circuit, 11: 7013(P)
equilibrium characteristics, 11: 5369(R), 8025(R)
laboratory vacuum controller, 11: 8904(J)
mass-sensing ionization, and control system, 11: 1920(R)

Vacuum pumps
(See also Diffusion pumps; Jet pumps.)
automatic two-stage, for transferring gases in a vacuum system, design, performance, and operation, 11: 2468
performance of accelerator, 11: 13837(R)
theory of steam-jet, 11: 7171(J)

Vacuum seals
(See also Gaseous diffusion plant seal systems; Seals and glands.)
design of swivel, for cyclotrons, 11: 4615(R)
sliding, for a scattering chamber, 11: 8906(J)
thermal-emf-free, cold setting thermoplastic, for electrical lead wires, 11: 8905(J)

Vacuum systems
bellows mounted with O-ring seals, 11: 1511
leak detectors, 11: 8904(J)
leakage test by He method, 11: 4485
for electromagnet of 10-Bev synchrotron, 11: 3185(J)
gaskets for, design of metal, 11: 3931(J)
properties of metals for use in construction, 11: 1510
size, effect of particle motion in FFAG accelerator, 11: 3164
sparking and x rays in a Hg pumped, 11: 13838(R)

Vacuum techniques
ionization method of obtaining a very high vacuum, 11: 7230(J)

Vacuum tubes
See Electron tubes.

Vacuum valves
(See also Valves.)
electrically operated, 6-in. design, 11: 1500
for gas filling system of He^3 fast neutron spectrometers, 11: 10172
pressure relief for dense vapor, design, 11: 3634(P)
Wood's alloy, for high temperature, 11: 8907(J)

Vacuum vessels
heat generation and thermal stresses, in MTA method for predicting, 11: 8732

Valeric acid, α-amino-δ-guanidino-
See Arginine.

Valve packing
See Seals and glands.

Valves
(See also Vacuum valves.)
application and limitation of freeze plugs for positive closure, 11: 7800
corrosion by radioactive solutions from the Redox Process, 11: 13754
design, 11: 13985(R)
design and testing of, for SAR project, 11: 13151
design for homogeneous reactors, 11: 10292
design for PWR primary cooling system, 11: 12608(R)
design for U reduction crucible to permit tapping, 11: 9543(P)
design of air operated control, 11: 11174
design of check, for homogeneous fuel systems, 11: 7861(R)
design of high-pressure, letdown, 11: 5831
development of HRE, 11: 11801(R)
development of PWR cooling system, 11: 9109(R), 10988(R)
development of stainless steel bellows, 11: 6536(R)
diaphragms for, testing, 11: 8552
electro-capillary, for micromeasurement of Hg, 11: 5186
evaluation of freeze seal for S2G Na stop, 11: 3553
failure of let-down, in slurry blanket test, 11: 9825
failure of Ti alloy trim in HRP-dump, 11: 308
hydraulic characteristics of 2" angle bellow, 11: 11671
for in-pile loop, testing, performance, and design, 11: 1509
leakproof, for water-cooled reactors, 11: 673(J)
liquid metal, durability and seat leakage tests, 11: 2421
operation in Na, 11: 7727
performance in HRT Mockup, 11: 9471
performance with ThO_2 slurries, 11: 9869(R)
sodium acceptance tests of SIR primary coolant stop, 11: 12560
stress corrosion in HRT mockup, 11: 9288
swing check, performance for Na flow and water flow, 11: 2451
testing of HRT vent, 11: 8650
testing PWR cooling system, 11: 6909(R)
testing SAR coolant loop isolation, 11: 12234
vapor-relief for dense vapor, design, 11: 3634(P)
welds in bellows of S1G Na stop, evaluation for leaks, 11: 3554

Van de Graaff accelerators
auxiliaries, 11: 10686(R)
beam optics in, mathematical analysis, 11: 724(J)
beam position regulators, 11: 726(J)

Van de Graaff accelerators (cont'd)

controller for high voltage regulator, 11: 1274(R)

current integrator, focusing lens system, target chambers and vacuum evaporator, 11: 1273(R)

design, 11: 722(J), 1274(R), 3179

design for neutron cross section measurements, 11: 590(J)

deuteron sources, 11: 730(J)

dosage measurements of x radiation from 2 Mev, 11: 720(J)

electromagnets for, control, 11: 725(J)

operation, 11: 722(J), 7292(R)

operation and installation, 11: 6863(R)

operation of ANL, 11: 550(R), 10231(R)

research programs at University of Florida, 11: 3179

testing and installation of Columbia, 11: 1273(R)

voltage regulation, 11: 723(J), 727(J)

Vanadium

activation determination in graphite, 11: 9996

activation determination in TiO_2, 11: 8296(R)

alloying effects on high-temperature rupture strength of ferritic steel, 11: 1168(J)

alpha-particle scattering at 40.2 Mev, 11: 6952(J)

amperometric determination in presence of other elements, 11: 11944(J)

analysis for N, 11: 7678(R)

analysis for O_2 by bromination-carbon reduction method, 11: 921

annealing of extruded and arc-melted, 11: 12555(R)

anodic oxidation, formation of films in potential region below O evolution, 11: 8017(J)

by-product recovery from carnotite ores, 11: 10857

chemical analysis, 11: 7676(R)

chlorination, recovery from ores by, 11: 7410

corrosion, 11: 9323

corrosion by molten Bi, 11: 12490(R)

corrosion by Na, thermal conductivity, 11: 10887(R)

colorimetric determination, 11: 8296(R)

coulometric determination with Ti^{3+}, 11: 941(J)

crystal structure, 11: 11703(R)

determination in U–V and Cr–U–V alloys, 11: 13606

determination in V–U mixtures, 11: 2262

energy levels from Coulomb excitation, 11: 2090(J)

gamma spectra, 11: 2090(J)

Hall effect in, at room temperature with fields up to 30 kilo-oersteds, 11: 5342

hardness, 11: 7676(R)

hardness, effect of O_2 on Vickers, 11: 12555(R)

mass transfer using liquid Bi, 11: 8524(R)

mechanical properties, 11: 12555(R)

neutron cross section relation to neutron wave length, 11: 1273(R)

neutron scattering by lattice vibration, 11: 755(J)

nonaqueous extraction from U ores, 11: 977

nuclear spallation by 170-Mev protons, 11: 6545

polarographic–amperometric determination, 11: 9234(J)

preparation, 11: 11704(R)

preparation and properties, 11: 8507(R)

preparation by bomb reduction of the oxide, 11: 8507(R)

preparation by reduction of UCl_4, 11: 7677(R)

Vanadium (cont'd)

preparation by thermal decomposition of VI_3, 11: 4454(R)

preparation from V_2O_3 and V_2O_5 by bomb reduction, 11: 7673(R)

purification by phosphate precipitation, 11: 11508(P)

radioactivity in, search for natural, 11: 8222(J)

recovery by fixed-screen resin-in-pulp process, 11: 11595

recovery from carbonate leach solution, 11: 13293

recovery from carbonate leach solutions by lead vanadate-caustic treatment, 11: 990

recovery from carnotite ores, 11: 11508(P)

recovery from leach solutions by precipitation, 11: 2302

recovery from phosphate solutions, 11: 3240(P)

recovery from U ores, 11: 2360, 2363, 4367

recovery from uranium ores by solvent extraction, 11: 13290

recovery processes, 11: 3759

separation from Ca by precipitation with cupferron, 11: 2269

separation from Ti, 11: 1542(R)

separation from U by ion xchange, 11: 4368(J)

solvent extraction by amines, 11: 186(R)

solvent extraction from acid, 11: 214

solvent extraction from acid leach liquors, 11: 2357

solvent extraction from carnotite sludges, 11: 9613

solvent extraction from carnotites with octyl phosphoric and octyl pyrophosphoric acids, 11: 4842(R)

solvent extraction from ferrous materials using acetylacetone, 11: 10442

solvent extraction from process solutions, 11: 7472(R), 7473(R)

solvent extraction in Dapex Process and Amine Extraction Process, 11: 7090(R)

spectrographic determination in raw materials for graphite production, 11: 8298

spectrophotometric determination in V–Al alloys, 11: 2828

tensile and creep properties, 11: 9323

Vanadium alloys

corrosion, 11: 5340, 9323, 11711(R)

corrosion by Na, thermal conductivity, 11: 10887(R)

electric conductivity, 11: 11711(R)

electrical properties, 11: 5340

hardness, 11: 5340

tensile and creep properties, 11: 9323

Vanadium–aluminum alloys
See Aluminum–vanadium alloys.

Vanadium–aluminum–titanium alloys
See Aluminum–titanium–vanadium alloys.

Vanadium borides

heat of formation, 11: 8909(J)

Vanadium chlorides

preparation by chlorinating VC, 11: 7673(R)

reduction with Mg at 800°C, 11: 11704(R)

Vanadium–chromium–iron–molybdenum alloys
See Chromium–iron–molybdenum–vanadium alloys.

Vanadium–chromium–uranium alloys
See Chromium–uranium–vanadium alloys.

Vanadium complexes

bonding and absorption spectra, 11: 4814(R)

Vanadium compounds
spectrophotometric determination of V^{4+} in alkaline solutions, 11: 9999

Vanadium fluorides
preparation, 11: 11703(R)
preparation by fluorination of VO_2, 11: 11578(R)
reduction with H, 11: 7678(R)
thermodynamic properties, 11: 3721(R)

Vanadium ions
aqueous solutions, spectrophotometric studies, 11: 3334(J)
solvent partition in ether–HNO_3–H_2O, 11: 13599(R)

Vanadium isotopes
formation during irradiation of stainless steel, 11: 10554

Vanadium isotopes V^{47}
decay properties, 11: 626(J), 1698(J)

Vanadium isotopes V^{48}
decay scheme and energy spectra, 11: 13449(J)

Vanadium isotopes V^{49}
energy levels, 11: 626(J)
radiative orbital electron capture, 11: 610(J)

Vanadium isotopes V^{51}
Coulomb excitation by N ions, γ rays from, 11: 4067(J)
neutron total cross sections and resonances in kev region, 11: 6065(J)
proton reactions (p,n), threshold and resonance peaks, 11: 7713

Vanadium minerals
(See also Roscoelites.)
occurrence in Peanut Mine, Montrose Co., Colo., 11: 13328(J)

Vanadium–molybdenum steel
See Molybdenum–vanadium steel.

Vanadium–niobium alloys
See Niobium–vanadium alloys.

Vanadium ores
carbonate leaching for U separation, 11: 11967
processing for U recovery by ion exchange, 11: 12705

Vanadium oxides
bomb reduction, 11: 7673(R)
dissociation energies of VO and VO_2, 11: 2919
preparation of high purity, 11: 4454(R)
recovery from basic or neutral solutions by reduction-precipitation, 11: 9530(P)
wet oxygen treatments of, containing N, 11: 7678(R)

Vanadium–oxygen systems
See Oxygen–vanadium systems.

Vanadium steel
(See also Molybdenum–vanadium steel.)
hardness, heat treatment, and thermal and mechanical properties, 11: 8011

Vanadium–tantalum alloys
See Tantalum–vanadium alloys.

Vanadium–titanium alloys
See Titanium–vanadium alloys.

Vanadium–uranium alloys
See Uranium–vanadium alloys.

Vanadium–uranium sandstone deposits (Ariz.)
See Uranium–vanadium sandstone deposits (Ariz.)

Vanadium–uranium sandstone deposits (Colo.)
See Uranium–vanadium sandstone deposits (Colo.)

Vanadium–uranium sandstone deposits (Mont.)
See Uranium–vanadium sandstone deposits (Mont.)

Vanadium–uranium sandstone deposits (Utah)
See Uranium–vanadium sandstone deposits (Utah)

Vanadium–uranium sandstone deposits (Wyo.)
See Uranium–vanadium sandstone deposits (Wyo.)

Vanadium–zirconium alloys
phase studies, 11: 7673(R), 11703(R)
temperature effects on, 11: 11703(R)

Vapor pressure
apparatus for measuring, 11: 13577(R)
measurement of low, methods and apparatus for, 11: 12072(J)
measurements of solid bismuth, by isotope exchange method, 11: 8028(J)

Vapor-slurry reactors
See Fluid fuel reactors.

Vapor valves
See Vacuum valves; Valves.

Vaporization
(See also Evaporation.)
following atomic explosions, 11: 1191(J)

Vapors
See Gases; Water vapor.

Vegetation
See Plants.

Vehicles
effects of blast from atomic explosion on motor, 11: 11830
operating control of bulldozer for burial of radioactive waste by remote-control equipment, 11: 11149

Vein deposits
occurrence in Buckhorn claims in Calif. and Nev., 11: 3402
occurrence of U bearing, in U. S., 11: 10084(R)

Vein deposits (Colo.)
occurrence in Golden Gate Canyon Area, 11: 1118(J)
paragenesis and structure of pitchblende, 11: 3826(J)

Vein deposits (Mont.)
occurrence in Boulder Batholith, 11: 2908(J), 5863(J)

Vein deposits (Utah)
occurrence in Silver King Claims, 11: 6355

Vein Mines deposits (Colo.)
parogenesis, occurrence in Wood and East Calhoun, 11: 12045(J)

Velocitrons
See Mass spectrometers.

Ventilation
(See also Exhaust systems; Laboratories.)
of hot labs, general considerations, 11: 11041(J)
testing of, in hot cells, 11: 2294

Versene
See Acetic acid, (ethylenediamine)tetra-, sodium salts.

Versene acid
See Acetic acid, (ethylenediamine) tetra-.

Vessels
(See also Blood vessels; Dissolvers; Naval vessels; Pressure vessels; Tanks; Vacuum vessels.)
ceramic-lined, 11: 7392(P)

Vessels (cont'd)

corrosion of HRT core vessel transition joint and expansion bellows mock-up, 11: 10529

design for liquid H_2 and He, 11: 7980(J)

design of precious-metal coated bombs for high-temperature studies, 11: 163(J)

materials, properties of graphite for, 11: 13279

radioactivity induced in homogeneous reactor core, 11: 11756

reactor, operating experience with NRX, 11: 5017

for reduction of U, method of tapping, 11: 9543(P)

rupture of continuous calciner pots, 11: 8003

shielding, effects of flow patterns on, 11: 1704(J)

for storage and transport of liquid H_2, 11: 7979(J)

Vibrating reed electrometers

sensitivity, 11: 448(R)

temperature effects, 11: 450(R)

Vibrations

equipment for damping mechanical, 11: 6749

thickness, theoretical discussion of, 11: 2540

Victoreen Instrument Co., Cleveland

progress reports on dose rate indicators, 11: 486(R), 4570(R)

Vinyl compounds

irradiation of polyvinyl methyl ether to form elastomers, 11: 11919

radiation chemistry, 11: 960(J)

Virgin Quadrangle (Ariz.-Utah)

photogeologic map, 11: 1096(J)

Viruses

poliomyelitis, effects of irradiation, 11: 5715(J)

radiosensitivity of tobacco mosaic, 11: 24(J), 5241(J), 7695(R)

Viscometers

design of falling ball, for use on ThO_2 slurries, 11: 6782

theory of rotating cylinder, in a Knudsen pressure regime, 11: 13377

Viscosity

of gas mixtures at high pressures, 11: 1213

Viscous flow
See Fluid flow (laminar).

Vistanex
See Plastics.

Vitamin A

(See also Carotene.)

radiation effects, 11: 13565(R)

therapeutic effects alone and with Ca-EDTA complex in radium poisoning, 11: 1760(J)

Vitamin B_2

chemical determination, 11: 4827(J)

Vitamin B_{12}

effects on I^{131} uptake by thyroid gland in adult and embryonic chickens, 11: 2610(J)

labeled with radiocobalt, applications in diagnosis of pernicious anemia, 11: 3678(J)

radiosensitivity effects in rats, 11: 11021(R)

Vitamin D

effects on bone mineralization of Ca^{45} and Sr^{89}, 11: 11021(R)

Vitamin D (cont'd)

effects on Ca metabolism and P excretion in cattle, 11: 5134(R)

effects on radium retention in rats, 11: 13254(J)

Vitamin P

radiosensitivity effects, 11: 5744(J)

Vitamins

radiation chemistry, 11: 960(J)

radioinduced changes, 11: 8783(J), 8861(J)

Vitreous enamels
See Porcelain enamels.

Vitro Corp. of America, New York

progress reports, 11: 9630(R)

progress reports on fission product utilization, 11: 8280(R)

progress reports of D_2O recovery, 11: 13677(R)

progress reports on homogeneous reactor fuel processing, 11: 7835(R), 7836(R), 7837(R), 8381(R), 9633(R), 11632(R), 11633(R), 11634(R), 11635(R), 11798(R), 13007(R), 13675(R), 13676(R), 13698(R)

progress reports on magnetic induction flowmeters, 11: 7700(R)

progress reports on preparation of metallic coatings by electrophoretic deposition, 11: 8514(R)

progress reports on Ra recovery, 11: 9631(R)

progress reports on U scrap reclamation, 11: 9632(R)

progress reports on waste recovery, 11: 9629(R)

Vitro Labs., West Orange, N. J.

progress reports in electrokinetic processes, 11: 4880(R), 11572(R), 11573(R), 13093(R)

progress reports on fission product separations, 11: 4430(R), 9255(R), 10473(R)

progress reports on homogeneous reactor fuel reprocessing, 11: 5024(R), 7536(R), 7838(R), 8382(R), 8383(R), 11636(R), 11637(R), 11638(R), 13951(R)

progress reports on solid-phase bonding of Ni alloys, 11: 1882(R)

Vitro Mfg. Co., Pittsburgh

progress reports on leaching and digestion of uraniferous slags, 11: 1478(R), 1479(R), 1480(R), 1481(R), 1482(R), 1483(R), 1484(R), 1485(R), 1486(R), 1813(R), 1814(R), 1815(R), 1816(R), 1817(R), 1818(R), 1819(R), 1820(R), 1821(R), 9691(R), 9692(R), 12394(R)

Voids
See Reactor shield voids.

Volatility separation processes

(See also Fluoride volatility processes.)

development of Hermex and Zircex Processes, 11: 10820(R)

for uranium and Pu separation, 11: 7541

Volatilization
See Evaporation; Vaporization.

Voltage breakdown
See Dielectric breakdown.

Voltage doubler
See Cockcroft-Walton accelerators.

Voltage regulators

(See also Power supplies.)

for calutron ion beam, 11: 5103(P)

design for Nuclear Test Airplane, 11: 3469

design for Van De Graaff control, 11: 727(J), 10686(R)

design of automatic, for Saclay Van de Graaff, 11: 723(J)

design of electro-mechanical integrator, 11: 12779

Voltage regulators (cont'd)

divider for measurement of pulse voltages up to 2000 kv, 11: 1560(J)

high-voltage low-impedance divider for photomultiplier tubes, 11: 10154(J)

precision selector for, 11: 8553

transistorized d-c power converter with regulated output, 11: 10617

Voltaic cells
See Dry batteries.

W

W-105 Reactors
See Hanford Production Reactors.

W-305 Reactor
See Hanford Test Reactor.

W. Wilson Mine (Mont.)

exploration, vein deposits, and U occurrence, 11: 2908(J)

secondary uranium mineral distribution, 11: 4444(J), 6359(J)

Washers

fabrication by Be powder sintering, 11: 2495(R), 9729(R), 11691(R)

Washington Univ., St. Louis

progress reports on radiation effects, 11: 8740(R)

Washington Univ., St. Louis. School of Engineering

progress reports, 11: 13203(R), 13204(R)

progress reports on radiation effects, 11: 8741(R)

Washington. Univ., Seattle. Applied Fisheries Lab.

radiobiological monitoring program for 1956 weapons test series, 11: 4250

Waspaloy
See Chromium–cobalt–nickel alloys.

Waste disposal

(See also Sewage; Sewage systems; Stack disposal; Waste recovery.)

AEC development program, 11: 1026

in agricultural research installations, 11: 4804

bibliography on, 11: 11175

by burial, remote-control of bulldozer for, 11: 11149

in ceramics and clays, 11: 12456(R)

cost factors for fuel recycling process, 11: 6890

cost factors for preconcentration of high activity acid, 11: 3778

decontamination, storage, radioactivity monitoring problems, 11: 683(J)

design of system for PWR site, 11: 6712(J)

developmental research, 11: 11556(R)

dilute processes, cost factors, 11: 11631

by dilution, effectiveness at KAPL, 11: 7920(R)

dilution, method of calculating activity, 11: 2246

dilution factor for KAPL discharge to Mohawk River, 11: 9577(R)

dosage from Ra sludge storage towers, 11: 2413

dry wells, feasibility study, 11: 2409

economic aspects, 11: 1844(J), 3377(J), 5006

economic aspects and radiation hazard potential of, for power reactors, 11: 10410

facilities at the Windscale Works, 11: 3376(J), 4399(J)

Waste disposal (cont'd)

in fuel processing, 11: 13225(J)

fusion of fission products in siliceous material, 11: 5827

health and safety problems, 11: 56(J)

heat generation in high-level wastes, 11: 257(J)

impact on chemical processing, 11: 2410

by ion exchange, 11: 6299(J)

liquid, at KAPL, 11: 8433

by liquid storage, 11: 7593(R), 11148, 12717

by liquid storage, effects of radiation on ground-inhabiting beetles, 11: 5143(J)

by liquid storage and dilution, facilities at ORNL, 11: 8430

by liquid storage at BNL, 11: 2635

liquid storage at ORNL, 11: 13017(R)

liquid storage basins for, heat transfer, 11: 13731

liquid storage following adsorption on clay, 11: 1497

liquid storage for HRT, 11: 10867

liquid storage in asphalt-lined pits, heat loss, 11: 5851(J)

liquid storage in vaults, caverns, and tanks, 11: 52(R), 3803

liquid storage tanks, design considerations, 11: 5852(J)

of liquids at Livermore site, 11: 13044

manuals, 11: 2343

by marine burial, summary of activities from 1946 to 1956, 11: 5829

methods evaluation, 11: 12240(R)

methods used at KAPL, 11: 10868

monitoring, processing, and storage, 11: 13517(J)

monitoring methods and instruments, 11: 8257(R)

by packaging radioactive wastes in ceramic bodies, 11: 8432

for PWR power plant, specification, 11: 11667

problems for power reactors, 11: 1843(J)

protection methods for buried radioactive waste lines, 11: 7983

of radioactive effluents at Aldermaston, 11: 6711(J)

radiological monitoring, 11: 8888

release of KAPL liquid wastes to Mohawk River, review of procedures, 11: 10859

routine operation of facilities at ORNL, 11: 12006(R)

by sea burial, factors affecting distance of the discharge point from the shore, 11: 6699

shielding requirements for liquid, from SRE, 11: 13969(R)

solid storage, 11: 7594(R)

solid storage in geologic structures, 11: 1026

solid storage in glass and in the ground, 11: 5291

solid storage removal of Ce^{137} and Sr^{90} before, 11: 5292(J)

survey of, in Britain, 11: 8889(J)

survey of methods, hazards, requirements, cost, and long-range consideration, 11: 9283

survey of procedures, 11: 12007

survey of methods, 11: 903(J), 1844(J), 3375

survey of problems at major AEC sites, 11: 12453

treatment, site considerations, long term aspects, 11: 683(J)

in White Oak Creek (ORNL), radioactivity, 11: 2412

Waste disposal conferences

at Brookhaven National Lab., 11: 2407

reports of AEC–Public Health Conference, Dec. 1955, at Cincinnati, 11: 1026

Waste processing

(See also Waste disposal; Waste recovery.)

AEC development program, 11: 1026

alkaline treatment of high level radiation Al wastes, 11: 10509

bibliography on, 11: 11175

calcination of aluminum-type wastes in a fluidized bed, 11: 12719

calcination of radioactive waste by fluidization with steam, 11: 11565

clarification of U refinery wastes, 11: 190(J)

concentration of Purex waste solutions by evaporation, 11: 7734(R)

by co-precipitation, for separation of Cs, 11: 8435(R)

coprecipitation of Purex Process waste, 11: 12386

cost analysis of evaporation vs. coprecipitation for, 11: 12441

cost factors, evaporation, and filtration, 11: 2407

decontamination, ion exchange development studies in, 11: 8434(R)

decontamination and volume reduction of Purex–TBP Metal Recovery wastes, 11: 7594(R)

decontamination from Sr using cationic resin, 11: 13581(R)

decontamination of TBP waste solutions by co-precipitation, 11: 12440

design of calciner for, and economics, 11: 11147(R)

dialysis of TBP solutions for recovery of HNO_3, 11: 6680

dilution, microscopy in treatment by, 11: 13382(J)

dissolution of sodium diuranate precipitate in metal waste tank, 11: 7591

distillation, 11: 7491

distillation of Purex Process wastes, 11: 7708(R)

effectiveness of oxidation ponds, 11: 4400(J)

economic aspects of various methods, 11: 10410

equipment and thermal conductivity of product, 11: 13884(R)

by evaporation, 11: 52(R), 7593(R), 12007, 13580(R)

evaporation, equipment design, 11: 2408

evaporation for recovery of U, 11: 8441(R)

evaporation of Purex Process acid wastes, multi-stage, 11: 7590

evaporation system flowsheet at Mound Lab., 11: 2411

evaporator design, 11: 13017(R)

evaporator design, effect on foaming and entrainment, 11: 2469

falling film evaporator for concentrating wastes, tests, 11: 2470

falling-film evaporator performance in ORNL, 11: 2306

filtration, 11: 13580(R)

fission product recovery from, for use as radiation sources, 11: 8280(R)

fission product removal from acid $Al(NO_3)_3$, 11: 7969

fission products pilot plant, 11: 9987

fixation by incorporation into ceramic bodies, 11: 6318

by fixation of activity in solid form following adsorption on soils, 11: 12005

fixation of highly active wastes in solid form, methods for, 11: 6319(J)

by ground leaching, influence of hydraulic characteristics of ground waters, 11: 7159

by incineration, 11: 7593(R), 7595

incineration, design of destructor plant, 11: 13732

incineration and ion exchange of laboratory liquid wastes, 11: 13579(R)

Waste processing (cont'd)

by incineration of low-level combustible waste in an open field, 11: 1842(J)

incinerator design for, 11: 12454

by ion exchange, 11: 9629(R), 11630(R), 11631, 12007, 13580(R)

by ion exchange on granular montmorillonite clay, 11: 13305

with lime-soda, equipment, 11: 5826

methods used at KAPL, 11: 10868

plant, cost estimate, 11: 5826

for power reactors, 11: 5006

by precipitation, 11: 12007

precipitation of radioisotopes from aqueous solutions with $Ca_3(PO_4)_2$, 11: 3779

precipitation with ferrous sulfide or ferrocyanide, effect of time, pH, and H, 11: 2469

preparation for storage or treatment of Redox Process, 11: 2472

of radioactive effluents at Aldermaston, 11: 6711(J)

radiological monitoring, 11: 8888

for recovery of Cs^{137} and Sr^{90}, 11: 12718

recovery of fission products from calcined first-cycle solvent extracti: wastes, 11: 12373

removal of Ce by cobaltcyanide precipitation, 11: 11084

removal of radioisotopes from PWR by ion exchange, 11: 5264

routine operation of facilities at ORNL, 11: 12006(R)

separation of NO_3^- and Al from fission products, 11: 4362

for separation of trace amounts of Cu^{64}, Mn^{56}, Np^{239}, and Na^{24}, 11: 11121

sludge digestion effect of radioactive materials on, 11: 4398

solvent extraction process development for ORNL, 11: 12368

sorption, 11: 10508

sorption of Ru and Zr, 11: 2469

sorption on solids and carrier precipitation of Bismuth Phosphate Process wastes, 11: 187

survey of problems at major AEC sites, 11: 12453

uranium recovery from MgF_2 slags by fluoride volatility, 11: 13655

uranium scrap reclamation, 11: 9632(R)

Waste recovery

application of pulse columns to recovery of U, 11: 11640

application of Purex Process to ORNL, 11: 12401

Hanford, operation of underwater test basin, 11: 13006

processing of ORNL salvage material for U recovery, 11: 7492

pulse column operating conditions for U recovery, 11: 11641

solvent extraction process for ORNL, 11: 12387

of U from Hanford waste metal sludge, 11: 7580

Waste slurries

See Hanford Waste Slurries.

Waste solutions

calcination, 11: 7407(R)

chelation as aid in eliminating bulk of contaminated salts in, 11: 13708

concentration, 11: 12717

corrosive effects, 11: 12717

corrosive effects of Redox, on mild and stainless steels, 11: 7523, 9723

corrosive effects on types 347 and 309 SCb stainless steels by simulated 25 Process, at various temperatures, 11: 7612

Waste solutions (cont'd)

ntamination of PWR, 11: 8719(R)

handling in buried stainless steel pipes, 11: 4429(R)

at Hanford, physical and chemical properties, 11: 7596

monitoring of, performance of a proportional sampler for, 11: 8790(R)

properties of neutralized and concentrated, 11: 13665

liometric analysis for Cs^{137}, 11: 4286, 8792(R)

Water

(See also Body water; Ground waters; Hydrogen–oxygen systems; Ice; Natural waters; Rain water; Sea water; Steam; Surface waters.)

acidity adjustment facility for Hanford reactors, 11: 2685

activity decay in pile cooling, 11: 1026

adsorption by ThO_2 at high temperatures, 11: 10837

analysis for D by densimetric float method, 11: 6269(J)

analysis for radioactive Cs, 11: 10003(J)

analysis for tritium, development of liquid scintillator for, 11: 6841(J)

analysis of ratio of D_2O to, by interferometer, 11: 1564

ntiproton interactions with nuclei, 11: 11362

earing lubricated by, tests, 11: 1049, 2453

boiling density studies at 600 psi, 11: 13868(R)

bubble growth in superheated, 11: 5783

burnout tests for, at 2000 psia and zero net flow in long rectangular channel, 11: 10062

chemical analysis, review, 11: 5789(J)

chemical analysis of Hanford Production Reactor cooling, 11: 9225

chemical determination in CO_2 using Karl Fischer reagent, 11: 7111

chemical reactions with molten metals, 11: 2253, 12968

chemical reactions with Zr and Zircaloy-2 in pressurized water reactor, 11: 13600

chemical reactions with Zr at high temperatures, 11: 14003

clarification, 11: 13006

coefficient of volatility for $H_2O^{16}-H_2O^{18}$ systems between 20 to 92°C, 11: 5769(J)

conductometric determination of hardness by complexone III, 11: 11945(J)

coolant in Hanford Production Reactors, process specifications for treatment of, 11: 13920

corrosive effects, 11: 2905, 8717(R)

corrosive effects of high-purity, symposium on, 11: 12035(J)

corrosive effects of high-temperature, in reactors, 11: 12029(J)

corrosive effects of high-temperature, on steel and stainless steel measured by hydrogen effusion, 11: 10537

corrosive effects on Al, 11: 8456, 11684

corrosive effects on Al, influence of trace metals on, 11: 8456

corrosive effects on Al, inhibition by addition of sodium silicate, 11: 10536

corrosive effects on Al and Al alloys at 100°C, 11: 5862(J)

corrosive effects on Al jacketed fuel elements, 11: 270

corrosive effects on annealed and 9-Mev proton-irradiated Th, 11: 8746

corrosive effects on carbon steel, 11: 8715(R)

corrosive effects on carbon steel pipe, 11: 2900

corrosive effects on low C steel at 600°F, 11: 6722(J)

corrosive effects on low-U Zr-base alloys by, 11: 9717

corrosive effects on MTR materials, effects of O content on, 11: 2487

corrosive effects on Nb–U alloys, 11: 8487(R)

Water (cont'd)

corrosive effects on Nb–U–Zr alloys, α-annealed and γ-quenched, 11: 7673(R)

corrosive effects on reactor materials, 11: 2903(J), 2904(J)

corrosive effects on stainless steel at high temperatures, 11: 3810

corrosive effects on thermal shield in NRU and NRX reactors, 11: 1864

corrosive effects on Sn alloys, 11: 11711(R)

corrosive effects on U, effects of temperature, 11: 7655(R)

corrosive effects on U and steel, 11: 11656(R)

corrosive effects on U–Mo alloys, 11: 8715(R), 8718(R)

corrosive effects on U oxides, 11: 8715(R)

corrosive effects on U–Si systems, 11: 8452

corrosive effects on U–Zr alloys, 11: 1868, 2899, 4860

corrosive effects on U–Zr alloys and apparatus for visual study of corrosion by, 11: 8443

corrosive effects on Zr, 11: 8718(R), 10881

corrosive effects on Zr alloys, 11: 8718(R), 10899(R)

corrosive effects on Zr and Zr alloys, 11: 10873, 13075(R), 13767(R), 13768(R)

corrosive effects on Zr-base fuel elements, 11: 6351

criticality effects of, in boiling D_2O reactors, 11: 13868(R)

decomposition by fission recoil particles, 11: 13516(J)

decomposition by Mg, 11: 1148(J)

decomposition in EBWR, 11: 11746(R)

decontamination by coagulation, 11: 1841

decontamination by municipal treatment plants, 11: 1026

decontamination by organic complexing and adsorption of activated charcoal, 11: 8318

decontamination by precipitation with $Ca_3(PO_4)_2$, 11: 3779

decontamination efficiency of municipal and industrial water treatment plants, 11: 1402

demineralization, procedures, and equipment, 11: 2279

demineralization, testing of resins for, 11: 1312(R)

demineralization of, at low solute concentration, 11: 5029(R)

demineralization of reactor coolant, 11: 5021

demineralizer for loop, 11: 1072

demineralizing reactor coolant, with ion exchange resins, 11: 7328(R)

determination in boric oxides, 11: 3337

determination in ThF_4, 11: 10812(R)

determination in UF_4, 11: 10852

deuteron reactions (d,n), 11: 9778

dissociation, effects of high temperatures, pressures and irradiation, 11: 2631

distribution and behavior in cation exchange resin membranes, 11: 13295(J)

distribution of light and heavy water in freezing mixture, 11: 5224(J)

dynamic compression by strong shock waves, 11: 6647(J)

energy dissipation characteristics calculated for various radiations, 11: 5978(J)

equation of state to 250 kilobars, 11: 6648(J)

equivalent orbital bond moments, 11: 4331(J)

evaporation at high humidities, kinetics, 11: 9212

exchange reactions with hydrated Li ions, 11: 9664(R)

fast neutron removal cross sections, 11: 14012

Water (cont'd)

flow, effect on performance of swing check valves, 11: 2451

flow at high temperatures and pressures, transverse, 11: 1503

flow rate effects of additives on boiling, 11: 13868(R)

fractional distillation, equilibration time for, 11: 13362(J)

friction coefficient variation in room-temperature, 11: 3380

gamma diffusion in water, determination of, 11: 2752

gamma diffusion through, energy and angular distribution, 11: 1618(R), 12285

gamma-ray absorption, 11: 760(J)

gamma-ray attenuation in, 11: 6132, 10365

gamma scattering by, calculated and experimental values, 11: 13198

gamma scattering in, calculation of multiple, 11: 8736

heat transfer, 11: 12012(R)

heat transfer and burnout at high subcritical pressures, 11: 5834

heat transfer and expulsion tests, 11: 10923(R)

heat transfer burnout in long rectangular channels, 11: 11166

heat transfer in, under transient conditions, 11: 7166

industrial applications, 11: 2905(J)

infiltration into soils, effects of chemicals on, 11: 11130

infrared absorption determination of trace amounts in biphenyl–water systems and isopropyl biphenyl–water systems, 11: 5309

internal recombination in homogeneous reactors, 11: 14014

ion exchange purification, 11: 10737(R)

ionization in vapor by 5 Mev α particles, energy loss, 11: 12931

isotopic analysis, 11: 10449(J)

isotopic analysis by decomposing with iron, 11: 9238(J)

light emission intensity, effect of energy of bombarding β particles, 11: 1371

mass transfer with isobutanol, 11: 9581(R)

neutron absorption, 11: 8748

neutron activation in reactors, 11: 13220

neutron age, Monte Carlo calculation, 11: 1618(R)

neutron attenuation, 11: 1618(R), 6132, 11739(R), 13197(R), 13426(J)

neutron attenuation, code for computing, 11: 11436

neutron attenuation in, at 14.1 Mev, 11: 6858(J)

neutron attenuation theory, 11: 2768

neutron cross sections, 11: 11739(R)

neutron diffusion, 11: 682(J), 3005, 10996(R)

neutron energy spectra in, programming of IBM 650 for, 11: 12884

neutron flux spectra in, comparison of calculated and measured, 11: 8112(J)

neutron induced activities in, 11: 4707

neutron reflecting properties in reactors, 11: 10294

neutron scattering, 11: 546(J), 1265

neutron scattering, energy distribution, 11: 1278(R)

neutron slowing down, 11: 543(J), 544(J), 682(J)

neutron slowing-down length in, using a pulsed source, 11: 7290(J)

neutron transmission and reflection, 11: 10923(R)

oxygen (O^{18}/O^{16}) ratios, variations of, 11: 8001(J)

physical properties, 11: 2878, 11669

process operations under, 11: 13006

purification by filtration, 11: 11668

purification by ion exchange and filtration, 11: 4267

Water (cont'd)

purification for S3G and S4G cooling system, 11: 3555

purification for use in high-temperature reactors, 11: 11781

purification of radioactive, by ion exchange, 11: 8251(P)

purification of reactor coolant, 11: 13501

purification of reactor cooling, by cyclone separator, 11: 2682

purification system for SFR coolant, 11: 3080

radiation chemistry, 11: 7456(R), 12339(R), 13623

radiation chemistry, theory, 11: 6670(J)

radiation chemistry of aqueous solutions containing Cl^- and Br^-, 11: 7457(R)

radiation effects, 11: 4163

radiation effects, high-temperature reactor coolant, 11: 963

radiation emitted, effect of β bombardment, 11: 1371

radiation monitoring equipment design, 11: 1240

radiative collisions of electrons with molecules of, abnormal rotation in, 11: 1211(J)

radioactivity induced in, 11: 12329(R)

radioinduced destruction of microŏrganisms in, 11: 4236(J)

radiological monitoring, 11: 8888

radiological monitoring for fission-product content, 11: 3481

radiometric analysis for Ra, 11: 11929

radiolysis, 11: 10818, 12970(R)

radiolysis by pile irradiation, 11: 9612 12330(R)

radiolysis in HRT during operation, 11: 646

radiolysis in HRT heat exchangers, generation of O_2 in, 11: 8608

radiometric analysis, 11: 8870

radiometric analysis, sample preparation, 11: 52(R)

radiometric analysis for Ra, 11: 1244

radiometric analysis for Sr^{90}, 11: 1592(J)

radiometric analysis for T_2, 11: 2273, 2274

radiometric analysis of drinking, 11: 210(J)

reactions with active metals at high temperature, 11: 11697

reactions with liquid metals in nuclear reactors, 11: 12323

reactions with Zr, thermodynamics, 11: 12059

recombination in homogeneous reactors, comparison of internal and external, 11: 7773

reduction to H by U for deuterium determination, 11: 5759

relative volatility of H_2O^{18}/H_2O^{16}, 11: 13362(J)

removal of activity from, by tannic acid and lime, 11: 10033

re-use in reactor cooling systems, 11: 2137(J)

separation from heavy water, 11: 6688(J)

separation from heavy water with triethylamine, 11: 6293

shielding properties, 11: 8748, 14033

solubility in biphenyl, 11: 78

solvent properties for La, Cd, Zn, Y, Cs, Ag, and Ba sulfates, 11: 3777(J)

solvent properties for $Nd_2(SO_4)_3$ at high temperatures, 11: 5757

solvent properties for O_2 from 212 to 325°F, 11: 1017

spatial distribution of thermal neutrons in mixtures of, and Zr, 11: 2619

spectrographic analysis for trace metals in high-purity, 11: 6254

spectrographic analysis of high purity, 11: 7110

temperature distribution in boiling, effect on heating loading, water height, 11: 1848

Water (cont'd)

thermal conductivity from 2 to 82°C, 11: 1855(J)

thermal decomposition, 11: 8707(R)

thermal neutron diffusion lengths, 11: 13885(R)

thermal neutron spatial distribution, 11: 6859(J)

thermal properties, comparison with D_2O, 11: 947(J)

treatment with sodium phosphates and hydrazine and sodium sulfates, effect of Cl on, 11: 2109

vapor glow discharge, paramagnetic resonance of products formed at low temperature, 11: 9239(J)

variation of O^{18}/O^{16} ratio in fresh, 11: 5374(J)

volumetric analysis, for alkalinity, 11: 9226

volumetric analysis for Ca and Mg, 11: 9227, 9228

warming curves for condensed products of dissociated vapor, 11: 6242(J)

Water-d

mass and heat transfer in concurrent liquid-gas flow in HDO–H_2O systems, 11: 12015(J)

millimeter wave spectral lines, 11: 135(J)

neutron cross sections, 11: 7843(R)

production, cascading problem in a water distillation plant for, 11: 141(J)

quadrupole coupling of deuteron in, 11: 11098

Water-d_2

adiabatic piezo-optic coefficient, 11: 12680(J)

analysis, 11: 203(J)

analysis of ratio of, to H_2O by interferometer, 11: 1564

antiproton interactions with nuclei, 11: 11362

boiling studies and separator design, 11: 13868(R)

corrosive effects, 11: 12584(R)

criticality effects, boiling D_2O reactors, 11: 13868(R)

decomposition, 11: 7708(R), 13675(R)

deuteron reactions (d,n), 11: 9778

distillation at 27°C, 11: 5226(J)

distribution of light and heavy water in freezing mixture, 11: 5224(J)

dual-temperature enrichment, optimum conditions for, 11: 6268(J)

effect on reaction rate of O_2 with $Pu_2(SO_4)_3$, 11: 5281(J)

evaporation, 11: 8707(R)

evaporation in gas separators, mathematical analysis, 11: 2285

exchange between D_2 and H_2, radiation effects on, 11: 3348(J)

exchange reactions with H, catalysis, 11: 8557(R)

gamma reactions (γ,n) in, effect on HRE kinetic behavior, 11: 8587

infrared spectrometric analysis for deuterium, 11: 5228(J)

isotopic analysis, 11: 6266(J)

isotopic effects on ethylene oxide hydrolysis, 11: 1453

maximum utilization in homogeneous slurry piles, 11: 13887

neutron diffusion in, 11: 7842(R), 11740(R)

neutron diffusion length in, 11: 9769

neutron energy spectra in, programming of IBM 650 for, 11: 12884

neutron mean free paths, 11: 542(J)

nuclear properties, 11: 11762

physical properties, 11: 2878, 3715, 7788

physiological effects on growth of algae, rats, and tumors in mice, 11: 12642(R)

Water-d_2 (cont'd)

production, vapor condenser design, 11: 12014(J)

production by chemical exchange, 11: 3347

production by Dual-Temperature Process, 11: 1788

production by electrolysis and isotopic exchange reaction, 11: 197(J)

production by low-temperature distillation of ammonia synthesis gas, 11: 3717

production in steam power plant, 11: 11547(P)

production methods, 11: 203(J), 3718(J), 5832(J)

production of, dynamic programming solution to problem of, 11: 10009(J)

purification at Savannah River Plant, 11: 3346

purification by distillation and ion exchange, 11: 12521(R)

quadrupole coupling of deuteron in, 11: 11098

radiolysis in HRT, 11: 646, 3716

recombination in aqueous homogeneous reactors, 11: 10292

recovery, 11: 11632(R), 11633(R), 12584(R), 13676(R), 13677(R)

recovery from homogeneous reactor blanket and core solutions, 11: 13643

recovery from HRT solutions, evaporators for, 11: 8623

recovery from UO_2SO_4 solutions, 11: 11634(R)

separation by evaporation, equipment design, 11: 7500(R)

separation from light water, 11: 6688(J)

separation from light water with triethylamine, 11: 6293

thermal conductivity from 2 to 82°C, 11: 1855(J)

thermal neutron diffusion, 11: 2179

thermal neutron transport mean free path, 11: 10334

thermal properties, comparison with H_2O, 11: 947(J)

tissue distribution in mice, 11: 7910(R)

toxic effects in rats, 11: 4781(R)

toxic effects in rats and mice, 11: 7910(R)

vapor glow discharge, paramagnetic resonance of products formed at low temperature, 11: 9239(J)

Water-t_2

preparation, 11: 7405(R)

radiometric analysis, 11: 3952

Water–acetic acid–benzene, methyl- systems
See Acetic acid–benzene, methyl-–water systems.

Water–acetic acid–benzene, nitro- systems
See Acetic acid–benzene, nitro-–water systems.

Water–acetic acid–carbon tetrachloride systems
See Acetic acid–carbon tetrachloride–water systems.

Water–acetic acid–chloroform systems
See Acetic acid–chloroform–water systems.

Water–acetic acid–isopropyl ether systems
See Acetic acid–isopropyl ether–water systems.

Water–acetic acid–2-pentanone, 4-methyl- systems
See Acetic acid–2-pentanone, 4-methyl-–water systems.

Water–aluminum systems
See Aluminum–water systems.

Water–beryllium sulfate–uranyl sulfate systems
See Beryllium sulfate–uranyl sulfate–water systems.

Water–biphenyl, isopropyl- systems
See Biphenyl, isopropyl-–water systems.

Water–biphenyl systems
See Biphenyl–water systems.

Water boiler
See Los Alamos Water Boiler.

Water boiler neutron sources

accountability, security, and health physics procedures for U^{235} in, 11: 12962

calibration and reactivity measurements by danger coefficients, 11: 7845(R)

control, 11: 7845(R)

danger coefficient testing of U and determination of U enrichment in, 11: 8691(R)

danger coefficient tests, 11: 12508(R)

description and safety hazards in operating, 11: 2722

design and operation of AE-6, 11: 11422

fuel requirements, 11: 9846

hazards evaluation for Livermore Research Lab., 11: 2709

instrumentation, 11: 7842(R)

operation, 11: 7843(R)

operations handbook for NAA Model L-3, 11: 6533

reactivity increases in, calculations, 11: 9848

Water–boric acid systems
See Boric acid–water systems.

Water-d_2–boric acid systems
See Boric acid–water-d_2 systems.

Water–boron fluoride systems
See Boron fluoride–water systems.

Water–butyl phosphate–kerosene–methanol systems
See Butyl phosphate–kerosene–methanol–water systems.

Water–butyl phosphate–kerosene–thorium nitrate systems
See Butyl phosphate–kerosene–thorium nitrate–water systems.

Water–butyl phosphate–methanol systems
See Butyl phosphate–methanol–water systems.

Water–butyl phosphate–thorium nitrate systems
See Butyl phosphate–thorium nitrate–water systems.

Water–chromium oxide–thorium(IV) oxide systems
See Chromium oxide–thorium(IV) oxide–water systems.

Water–copper sulfate–uranyl sulfate systems
See Copper sulfate–uranyl sulfate–water systems.

Water–deuterium systems
See Deuterium–water systems.

Water–helium systems
See Helium–water systems.

Water–hydrogen–oxygen systems
See Hydrogen–oxygen–water systems.

Water–hydrogen sulfide systems
See Hydrogen sulfide–water systems.

Water–hydrogen systems
See Hydrogen–water systems.

Water–iron systems
See Iron–water systems.

Water–methanol systems
See Methanol–water systems.

Water moderated reactors

(See also the specific water moderated reactors.)

bubble formation in, design of system to prevent, 11: 7760

Water moderated reactors (cont'd)

buckling measurements on 1%-enriched rods of, in H_2O and uranyl nitrate solutions, 11: 1657

critical equation for bare, 11: 10316(J)

design and data for advanced engineering test, 11: 11389

design by ORSORT for research and isotope production, 11: 12528

design of advanced engineering test, 11: 10714

design of Westinghouse Testing Reactor, 11: 1670(J)

diffusion theory of, comparison to group theory, 11: 5572

economic study of heavy- and light-, 11: 13916

exponential measurements and heat transfer studies, 11: 9859

fast fission factor calculations for heterogeneous, 11: 9872

feasibility of power producing, with fuel cycle using natural U feed and Pu recycle, 11: 5023

flux peaking near water gaps, 11: 2117

group theory for completely reflected cylindrical, 11: 1618(R)

heat transfer and boiling burnout, 11: 6705(R)

heterogeneous, light, bibliography, 11: 9089

neutron cross section tables for nuclides over spectra of, 11: 6508

neutron flux, 11: 11389

neutron flux calculations for, approximate spatially separable, 11: 10300

neutron flux distribution, 11: 10915

neutron leakage, 11: 1655

pressure vessel for, design and fabrication of, 11: 13128

reactivity effects of D_2O additions to H_2O moderator, 11: 1618(R)

safety and self regulation, description of, and experiments on, 11: 56(J)

transient behavior of sub-cooled, 11: 6101(J)

water dissociation in power, effect of temperature, pressure, and irradiation on, 11: 2631

Water–nickel sulfate–uranyl sulfate systems
See Nickel sulfate–uranyl sulfate–water systems.

Water–nitric acid–thorium nitrate systems
See Nitric acid–thorium nitrate–water systems.

Water–nitric acid–uranyl nitrate systems
See Nitric acid–uranyl nitrate–water systems.

Water–oxygen systems
See Oxygen–water systems.

Water-d_2–oxygen systems
See Oxygen–water-d_2 systems.

Water–2-pentanone, 4-methyl- systems
See 2-pentanone, 4-methyl-–water systems.

Water pipes
See Pipes.

Water–plutonium–uranium systems
See Plutonium–uranium–water systems.

Water purification equipment

description of BSF, 11: 1618(R)

design and operation of model at Hanford, 11: 11668

efficiency for removal of fission products from fall-out, 11: 1402

testing of valve pit header screens, 11: 3782

Water–sodium chloride systems
See Sodium chloride–water systems.

Water–steam systems
See Steam–water systems.

Water–sulfur trioxide–uranium(VI) oxide systems
See Sulfur trioxide–uranium(VI) oxide–water systems.

Water–thorium nitrate systems
See Thorium nitrate–water systems.

Water-d_2–thorium oxide systems
See Thorium oxide–water-d_2 systems.

Water–uranium(VI) oxide systems
See Uranium(VI) oxide–water systems.

Water–uranium(VI) oxide–uranyl sulfate systems
See Uranium(VI) oxide–uranyl sulfate–water systems.

Water–uranium systems
See Uranium–water systems.

Water–uranyl chromate systems
See Uranyl chromate–water systems.

Water–uranyl fluoride systems
See Uranyl fluoride–water systems.

Water-d_2–uranyl fluoride systems
See Uranyl fluoride–water-d_2 systems.

Water–uranyl nitrate systems
See Uranyl nitrate–water systems.

Water–uranyl sulfate systems
See Uranyl sulfate–water systems.

Water-d_2–uranyl sulfate systems
See Uranyl sulfate–water-d_2 systems.

Water vapor
(See also Steam.)
corrosive effects on U, 11: 2485
reaction with Ca, kinetics of, 11: 7938(J), 8820
reaction with Mg, 11: 9220(J)
reaction with magnesium, kinetics of, 11: 12732
reaction with Zr at subatmospheric pressures, 11: 7939(J)

Water–zirconium systems
chemical reactions, 11: 11913(R)
neutron reflecting properties in reactors, 11: 10294
spatial distribution of thermal neutrons, 11: 2619

Wave mechanics
(See also Mathematics; Physics.)
continued fraction approximants to the Brillouin-Wigner perturbation series, 11: 10382(J)
functions, tables of charged particle penetrabilities or Coulomb, 11: 10633

Waveguides
See Microwave equipment.

Wavellites
separation from kaolinites, 11: 291(J)

Waves
See Detonation waves; Electromagnetic waves; Hydromagnetic waves; Microwaves; Shock waves.

WBNS
See Water boiler neutron sources.

Weapons
See Atomic weapons; Thermonuclear weapons.

Wear
manual for water-cooled reactors, 11: 12028
testing, in moving parts in 200 to 500°F water environment, 11: 5303
testing equipment, 11: 8007(R)
testing equipment for shaft seals, 11: 6321

Weighing
See Balances.

Welded joints
bursting strength of concave and convex canopy seal, 11: 6371, 6372
corrosion of stainless steel, in the PWR, 11: 1375
corrosion of 347 stainless steel, by Thorex Process solutions, 11: 13744
corrosion of Zircaloy-2 and -3, effect of welding atmosphere and pickling, 11: 11184
creep under constant loads and temperatures, 11: 6375
design recommendations on, 11: 5905(J)
failure of, of carbon steel to stainless steel, 11: 13091
mechanical properties, effects of interstitial additions, 11: 333
non-destructive inspection, 11: 7172(J)
radiation effects on stainless steel, in PWR, 11: 1375
root-pass, design without filler metal, 11: 4895(J)
of stainless steel to Croloy, testing and thermal shock, 11: 1879
testing and evaluation, 11: 12020

Welding
(See also Brazing.)
application of ultrasonic energy to cold, 11: 11207
arc, performance of Ti and Ti alloy electrodes, 11: 13346
electrodes, comparison of thoriated, zirconiated, and pure tungsten, 11: 4897(J)
equipment, testing, and techniques for, of heat exchangers, 11: 5873
equipment for argon-arc, 11: 3836
equipment for remote, 11: 8688(R)
equipment for UO_2 fuel rods, 11: 13780
of heat- and corrosion-resistant alloys, metallurgy of, 11: 10580(J)
in inert atmospheres in HRP program, 11: 5332
joint design for root-pass welds without filler metal, 11: 4895(J)
machines for seal-, operating experience, 11: 12501
manual procedure for a pressure vessel closure, 11: 2499
in metals, bibliography, 11: 13819
of molybdenum, book, 11: 9342(J)
problems encountered in, of pressure vessels for nuclear reactors, 11: 12066(J)
procedures for reactor instrument, 11: 8172
remote, device for, 11: 6386
remote, of reactor tubes, equipment for, 11: 8687(R)
stainless steel, filler wires for, 11: 8010(R)
of stainless-clad C steel from unclad surface, 11: 4896(J)
techniques for end capping of PWR fuel elements, 11: 12472
techniques in atomic energy plants, 11: 5356(J)
techniques and testing, 11: 1912(J)
of titanium alloys, effect of C, N_2, and O_2 on, 11: 6391(R)
of titanium and Ti alloys and characteristics of d-c arcs with Ti anodes and W cathodes in inert gases, 11: 334
of tubes of Zircaloy-2, inert gas, tungsten arc, 11: 4894(J)
of Zircaloy-2, 11: 9341(J)

Welding rods
preparation of Mn-containing, 11: 7859(R)

Welds
in austenitic stainless steel, corrosion in UO_2SO_4, 11: 8708(R)

Welds (cont'd)

corrosion in Redox dissolver, effect of HNO_3, 11: 13748

corrosion of stainless steel, 11: 7859(R)

crack sensitivity of metal arc, 11: 3842

cracking, causes in high-strength, 11: 5327(R)

cracking susceptibility tests for, in sheet materials, 11: 376(J)

ductility of tungsten-arc, in Mo, 11: 8936(J)

effects of N on soundness and ductility of, in Mo, 11: 8937(J)

evaluation of Ti–Al–V deposits, 11: 1528

failure in primary heat exchanger of EBR, 11: 9833

fracture and mechanical shock resistance, 11: 8922

fracture tests, 11: 3846

hardness of stainless steel, in NaK, 11: 13113(R)

impact tests of Hf–Zircaloy 2, 11: 13821

leaks in S1G Na stop valve bellows, 11: 3554

mechanical properties, effects of halogens and halides on, 11: 5881

nondestructive testing, 11: 1056(J)

porosity, determination of cause and means of prevention in PWR fuel element and closures, 11: 10902

radiographs of defects in, standard comparison, 11: 1062

rupture of stainless steel calciner pot, 11: 8003

stress corrosion of, in Ti alloys at 700°F, 11: 12067(J)

stresses in, of seals, 11: 12720

tensile properties, 11: 3842

tensile properties of Hf–Zircaloy-2, 11: 2534

testing, 11: 3842, 13770

testing, after thermal cycling, 11: 13090

testing of kovar-to-stainless steel, 11: 1880

Well logging

apparatus using neutron source and Al pad, 11: 5711(P)

effects of Rn in drill holes on gamma-ray logs, 11: 11192(J)

equipment, design of portable, for sampling test wells, 11: 12725

gamma-ray detectors used for, addition of NH_3 to prevent quenching, 11: 6591(P)

resistivity data from electric, 11: 8913

use of radioisotopes in oil-, 11: 10583(J)

West Milton Reactor
See KAPL Intermediate Power Breeder; Submarine Intermediate Reactor.

Westinghouse Electric Corp. Atomic Power Div., Pittsburgh

progress reports on sleeve bearing tests, 11: 2455(R)

progress reports on Shippingport Pressurized Water Reactor, 11: 8715(R), 8716(R), 8717(R), 8718(R), 8719(R), 8720(R), 10986(R), 10987(R), 11806(R), 11808(R)

Westinghouse Electric Corp. Aviation Gas Turbine Div., Kansas City, Mo.

progress reports on development of Nb-base alloys, 11: 3831(R)

Westinghouse Electric Corp. Bettis Plant, Pittsburgh

progress reports on Pressurized Water Reactor program, 11: 6909(R), 9109(R), 10737(R), 10988(R), 12608(R), 13189(R)

progress reports on UO_2, 11: 12000(R)

Westinghouse Electric Corp. Commercial Atomic Power Activity, Pittsburgh
progress reports, 11: 5033(R)

Westinghouse Electric Corp. Lamp Div., Bloomfield, N. J.

progress reports on U production, 11: 2368(R)

Westinghouse Electric Corp. Research Labs., East Pittsburgh, Penna.

progress reports on molybdenum, 11: 4466(R)

Westinghouse Test Reactor (WTR)
See Research reactors.

Westwater Canyon Member (N. Mex.)

geology, 11: 2910(J)

Wet B Separation Process
See Lanthanum Fluoride Process.

Wet D Separation Process
See Bismuth Phosphate Process.

Wet Fluoride Process
See Lanthanum Fluoride Process.

Wheat

radioinduced rust-resistant mutants, 11: 1399

White Canyon Quadrangle (Utah)

photogeologic map, 11: 1089(J), 1112(J)

White Cloud Area (Nev.)

geology, U occurrence, 11: 3403

White Oak Creek

fission product contamination, 11: 2412

White River Formation (Wyo.)

geology, 11: 12734

Wigner effect

method of predicting, on pile graphite, 11: 8307

Wind

direction sensing and recording device, 11: 3259(P)

effects of velocity on nasal penetration of aerosols, 11: 11018

position variability data, 11: 8941

radar wind data recorder, design, and operation, 11: 2577

velocity calculations, 11: 13413(J)

Windows

design and materials for, 11: 11269(J)

gamma-absorptive, glass formula, 11: 5710(P)

Wingate Formation

stratigraphy of, in upper triassic strata in southeastern Utah, 11: 6723(J)

Wire-mesh entrainment separators

design calculations for the HRT core processing plant, 11: 10939

Wire recorders
See Magnetic recording systems.

Wires

(See also Reactor fuel wires.)

heat transfer from, effect of surfaces on boiling, 11: 1122

variations in the distance between different points, effect of radioactive marking, 11: 1250(J)

waterproofing techniques for, associated with strain gages, 11: 456

Wisconsin Alumni Research Foundation, Madison

progress reports on wholesomeness of irradiated foods, 11: 1723(R)

WMA Reactor
See KAPL Intermediate Power Breeder.

Wolfram
See Tungsten.

Wood

deterioration of redwood cooling towers, chemical and fungal, 11: 7935

fireproofing for U containers, 11: 2419

Wood Mine (Colo.)

geology, mineralogy, and pitchblende occurrence, 11: 12045(J)

Wright Air Development Center. Materials Lab., Wright-Patterson AFB, Ohio

progress reports on fluorine analysis, 11: 3342(R)

progress reports on Ti alloys, 11: 330(R)

progress reports on Ti and Ti alloys, 11: 1432(R)

Wyandotte Chemicals Corp., Wyandotte, Mich.

progress reports on synthesis and evaluation of high-temperature and nuclear radiation stable fluids, 11: 10042(R)

Wyoming

exploration of Bald Mountain Area in Big Horn and Sheridan Cos. and monazite deposits, 11: 5316

exploration for Th and radioactive black mineral deposits, 11: 3825

geologic map of Gas Hills Uranium District in Fremont and Montrose Counties, 11: 1088(J)

mineral determinations in U deposits in, 11: 5317

uranium deposits, collected field material on, 11: 6356(R)

uranium-V sandstone deposits in Northeastern, 11: 7996(J)

Wyoming (Campbell Co.)

preliminary geologic map of Pumpkin Buttes Area showing location of U occurrences, 11: 9296(J)

Wyoming (Carbon Co.)

geophysical exploration of Browns Park Formation, 11: 4433

Wyoming (Crook Co.)

geology of Busfield deposit in, 11: 4862

Wyoming (Fremont Co.)

geologic map of Lucky MC Uranium Deposit in, 11: 1088(J)

Wyoming (Johnson Co.)

preliminary geologic map of Pumpkin Buttes Area showing location of U occurrences, 11: 9296(J)

uranium deposits of the Mayoworth area in, 11: 3830(J)

Wyoming (Niobrara Co.)

exploration and geology of Lance Creek Area, 11: 12734

Wyoming (Sweetwater Co.)

exploration of Red Desert Area for U deposits, 11: 5322(J)

X

X-10 Reactor
See ORNL Graphite Reactor.

X radiation

(See also Gamma radiation; Photons.)

absorption, 11: 12639(R)

absorption in metal complexes, 11: 737(J), 738(J)

attenuation coefficients of 0.01 to 100 Mev for 29 materials, 11: 11466(J)

attenuation data for 50 to 300 kvp in concrete shielding, 11: 3619(J)

biochemical changes induced by, 11: 2780, 2791(J), 4237(J)

biological effects, 11: 21, 831, 833, 870(R), 872(J), 1737(J), 6596(R), 8785(J)

biological effects, effects of dosage levels, 11: 8806

X radiation (cont'd)

biological effects compared with effects of γ radiation in production of chromosomal aberrations in Tradescantia, 11: 7049(J)

biological effects of, from 4 Mev linear accelerator and deep therapy sources, 11: 9920(J)

biological effects of doses of 15 to 200 r whole-body exposure on cancer patients, 11: 12655

biological effects on dormant barley seed, influence of fractionated dose, 11: 7914(J)

biological effects on rats, 11: 13234

biological efficiency of various voltages, 11: 2793(J), 4789(J)

blood-serum changes induced by exposure, 11: 10399(J)

cataracts induced in laboratory animals following exposure, 11: 871(J), 5139(J)

chemical effects of, from 4 Mev linear accelerator and deep therapy sources, 11: 9920(J)

chromosome aberrations induced in Tradescantia by exposure, effects of oxygen tension, 11: 861(J)

cytogenetic effects on dormant tomato seed, 11: 13237(J)

degradation of methionine induced by exposure, 11: 5242(J)

delayed lethal effects in whole-body exposure to, 11: 11031(J)

delayed pupation in Drosophila induced by, 11: 2792(J)

detection and measurement, 11: 13565(R)

detection and measurement, CdS cells for, 11: 509(J)

detection and measurement, calibration of dosimeters, 11: 513(J)

detection and measurement, efficiency of photographic film detectors and rate meters, 11: 8792(R)

detection and measurement, performance of alkali halide crystals for, 11: 1249(J)

detection in the presence of hard γ rays, instruments, 11: 4535

diffuse scattering by solid solutions, theory, 11: 12926(J)

diuresis in rats following whole-body exposure, 11: 8767(J)

dosage determinations, 11: 6596(R)

dosage determinations, effectiveness of photographic film detectors, 11: 6477

dosage determinations, performance of dosimeters, 11: 21

dosage determinations, performance of scintillation crystal dosimeter, 11: 490(J)

dosage determinations, performance of tissue-equivalent plastic-film detectors, 11: 10181(J)

dosage determinations for chest cavity, 11: 2803(J), 2991(J)

dosage determinations for gonadal region in man during standard clinical roentgenographic examinations, 11: 12961(R)

dosage determinations in bone tumors, effects of phosphatase and calcium deposits on, 11: 9970(J)

dosage determinations in inhomogeneous bodies, 11: 2981(J)

dosage determinations of, from 4-Mev linear accelerator beam, 11: 5461(J)

dosage measurements of, produced by 2 Mev Van de Graaff machine, 11: 720(J)

dosage of, design and performance of chemical detectors for determining, 11: 12517(R)

dosimetric measurement method, 11: 1970(J)

dosimetry, 11: 10803(R)

dosimetry, performance of chemical dosimeters and Victoreen R-meter, 11: 6469

dosimetry of 1 Mev beam employing calorimeters, 11: 2990(J)

dosimetry using ferrous sulfate solutions, 11: 4577(J)

X radiation (cont'd)

effects of direct exposure of kidneys to, on renal function, 11: 6194(J)

effects of exposure of legs of mice on phosphorus uptake by knee joint tibia, tracer study, 11: 28(J)

effects of exposure of oviduct on egg production and quality in fowl, 11: 856(J)

effects of exposure of pregnant rats on congenital cardiac anomalies in offspring, 11: 3666(J)

effects of exposure on cellular composition of peritoneal fluid, 11: 6201(J)

effects of exposure on growth of populations of Chilomonas paramecium, 11: 11861(J)

effects of exposure on nucleic acid synthesis in mouse Ehrlich ascites tumor cells, tracer study, 11: 3665(J)

effects of exposure on partially shielded lens of rabbits, 11: 8769(J)

effects of exposure on plasma iron levels in rats, 11: 11847(J)

effects of exposure on protective properties of antitetanus serum, 11: 6604(J)

effect of exposure on response of rickettsia to antibiotics, in embryonate eggs, 11: 6200

effects of exposure on serum transaminase level, 11: 10396

effects of exposure on serum transaminase levels in rabbits, 11: 2788(J)

effects of exposure on susceptibility to infections in mice, 11: 7909

effects of exposure on thymus acid phosphatase level in mice, 11: 1745(J)

effects of exposure to, on antibody formation in mice treated with rat bone marrow, 11: 5151(J)

effects of exposure to, on desoxyribonuclease activity in cysteine treated rats, 11: 11961(J)

effects of exposure to, on formation and accumulation of hemolytic factor in rats, 11: 841(J)

effects of high doses on growth of seedlings, 11: 5716(J)

effects of preexposure of tumor bed to, on growth of transplanted carcinoma in mice, 11: 860(J)

effects of small doses of, on immunity against typhoid fever bacteria, 11: 11028(J)

effects of successive exposure to, on radiosensitivity of Nocardia corallina, 11: 11856(J)

effects of total body, on susceptibility of mice to E. coli endotoxin, 11: 11865(J)

effects of total body exposure to continuous lethal doses of, in rats, 11: 9931(J)

effects of whole-body, on enzymatic activity of rat tissue toward uridine, cytidine, uridylic acid, and cytidylic acid, 11: 8779(J)

effects of whole-body and local exposure on liver cell nuclei, 11: 1398

effects of whole-body exposure of rats, on bone marrow structure, 11: 11025(J)

effects of whole-body exposure on bacteremia in mice, 11: 1393

effects of whole-body exposure on blood iron and lipoprotein levels, 11: 7695(R)

effects of whole-body exposure on blood serum, as demonstrated by ultraviolet spectrographic analysis, 11: 29(J)

effects of whole-body exposure on cardiovascular system in rats, 11: 5142(J)

effects of whole-body exposure on glucose and fructose metabolism in liver of rats, 11: 4230(J)

effects of whole-body exposure on glucuronidase activity in lymphatic tissues in rats, 11: 5717(J)

effects of whole-body exposure on hematopoietic organs in mice, 11: 3277(J)

effects of whole-body exposure on mast cells in rat mesentery, 11: 838(J)

X radiation (cont'd)

effects of whole-body exposure on megakaryocytic system in young rats, 11: 4791(J)

effects of whole-body exposure on phagocytic activity, 11: 11840

effects of whole-body exposure on phagocytic index, 11: 2778

effects of whole-body exposure on phosphatase activity in mouse tissue, 11: 22(J)

effects of whole-body exposure on potassium content of heart in rabbits, 11: 3667(J)

effects of whole-body exposure on reflexes of mice, 11: 2783(J)

effects of whole-body exposure on urinary coproporphyrin excretion, 11: 1394

effects of whole-body exposure on work output and excretion of histamine by rats, and plasma Cu content in burros, 11: 7398(R)

effects of whole-body exposure to, on blood pressure in rabbits, 11: 9937(J)

effects of whole-body exposure to, on blood volume of splenectomized dogs, 11: 11872(J)

effects of whole-body exposure to, on nucleic acid content of appendix and thymus in rabbits, 11: 9921(J)

effects of whole-body exposure to, on peritoneal fluid cells and peripheral blood leukocytes in pollen-sensitized rats, 11: 11871(J)

effects on activity of sperm in mouse, 11: 9934(J)

effects on animals subjected to work before exposure to, 11: 13243(J)

effects on antibody production in rabbits, 11: 9925(J)

effects on behavior of rats, guinea pigs, and hamsters, 11: 4228

effects on blood constituents of new-born rats, 11: 9195(J)

effects on blood picture of mice treated by protective agents before irradiation, 11: 5737

effects on blood plasma Fe values in burros and fat absorption in rats, 11: 8258(R)

effects on blood plasma lipoprotein levels in rats, 11: 108

effects on bone growth, 11: 6601(J)

effects on bone growth in chickens, 11: 40(J)

effects on catalase solutions, 11: 1729(J), 1730(J)

effects on cell division in bone marrow tissue cultures, 11: 41(J)

effects on clotting defect in purified bovine fibrinogen, 11: 4839(J)

effects on crystallized proteins, 11: 8860(J)

effects on developing embryos, 11: 10408(J)

effects on development of diphtheria antitoxin, 11: 3662(J)

effects on development of nerve cells in chick embryo tissue cultures, 11: 863(J)

effects on Drosophila testes and method for obtaining spermatogonial mutational rates, 11: 9933(J)

effects on embryogenesis in early stages, 11: 1735(J)

effects on enzymatic activity of irradiated exteriorized rat salivary glands, 11: 23(J)

effects on enzyme activity in rat spleen homogenates, 11: 7915(J), 7916(J)

effects on erythrocyte and brain cholinesterase levels in rats, 11: 1771

effects on eyes of rabbits, influence of partial shielding, 11: 4229(J)

effects on fatty acid metabolism, and on histamine excretion and edema, in rats, 11: 2237(R)

effects on formate metabolism in rats, tracer study, 11: 5183(J)

effects on fully-developed bones of guinea pigs, 11: 43(J)

effects on gastric emptying in rats, 11: 12959(R)

effects on gastrointestinal function in rats, 11: 865(J)

X radiation (cont'd)
effects on glucose solutions, 11: 5814(J)
effects on glycogen content of surviving leucocytes, 11: 9200(J)
effects on goitrogenesis in rat thyroid gland, 11: 4788(J)
effects on growth of internodal cells of C. vulgaris, 11: 9199(J)
effects on growth of rat tumors, 11: 5140(J)
effects on growth of rickettsia in embronate eggs, 11: 6199
effects on hematopoietic system of newborn rats, 11: 7061(J)
effects on hematopoietic system of salamander, 11: 1739(J)
effects on hemolysin formation in rabbits, 11: 4238(J), 4792(J)
effects on incorporation of P^{32} in desoxyribonucleic acid of regenerating mouse liver, 11: 4233(J)
effects on induction of mutants in yeast, 11: 862(J)
effects on immune response in mice, 11: 11027(J)
effects on isolated intestinal loops in experimental animals, 11: 5141(J)
effects on longevity of physicians receiving continued low-level exposure, 11: 846(J)
effects on lymphatic tissue, quantitative aspects, 11: 8781(J)
effects on maturation of rat ovum, 11: 4234(J)
effects on metabolism and life span of rats, 11: 10394
effects on metabolism of fatty acids and histamine excretion, 11: 2233(R)
effects on mitosis in ascites tumor cells, 11: 1732(J)
effects on mitosis in roots of Vicia, 11: 843(J)
effects on mitosis in seed, influence of cysteine treatment, 11: 5741(J)
effects on molecular weight of nucleic acid in tobacco mosaic virus, 11: 5241(J)
effects on mortality and skin transplantability in mice, 11: 35(J)
effects on nucleic acid metabolism in rats, 11: 10398
effects on oat seed in different phases of ontogenetic development, 11: 5162(J)
effects on oral cavity in mice, 11: 859(J)
effects on oxygen consumption in bullfrog erythrocytes, 11: 4231(J)
effects on paramecium at conjugation, 11: 845(J)
effects on pectin, 11: 967(J)
effects on penetrability of placentary barrier at different periods of pregnancy in rabbits, 11: 13235(J)
effects on phosphorus incorporation into nucleic acid synthesis in rat sarcoma, 11: 9971(J)
effects on plasma Fe and hemoglobin values in rabbits, 11: 12961(R)
effects on plasma lipid fractions of rabbit, 11: 11868(J)
effects on protein and nucleoprotein metabolism in rats, 11: 7052(J)
effects on pyrimidines, modifications produced by sulfhydryl compounds, 11: 4332
effects on rat adrenal glands, 11: 9197(J)
effects on rats, influence of dose rate and age, 11: 850(J)
effects on regeneration of muscular tissues, 11: 849(J)
effects on respiration of rat duodenal mucosa homogenates, 11: 4239(J)
effects on response of nervous system, 11: 8782(J)
effects on rust infection types of fungi, 11: 2795(J)
effects on skin of mice, 11: 7053(J)
effects on solid catalysts, 11: 11963(J)
effects on spermatogenesis in rats, 11: 12645, 12646
X radiation (cont'd)
effects on susceptibility to transplanted leukemia in mice, 11: 866(J), 867(J)
effects on synthesis of nucleic acids in mouse tumors, tracer study, 11: 3653(J), 3654(J), 3655(J)
effects on viability of slices of mouse melanoma, 11: 1741(J)
effects on vitamins, 11: 8783(J), 8861(J)
from electric discharge in gases, 11: 434(J)
excitation of characteristic K, by impact of heavy charged particles, 11: 6137(J)
flower color changes induced by exposure of carnation clones, 11: 11846(J)
genetic effects in maize, influence of oxygen, 11: 4242(J)
genetic effects in yeast, 11: 11843
inactivation of desoxyribonuclease by, 11: 5810(J), 5811(J)
inactivation of yeast by, at low temperatures, 11: 11034(J)
induced dehydration effects on embryo mortality, 11: 9922(J)
influence of exposure on traumatic shock in rats, 11: 5159(J)
influence on release of cellular constituents by E coli, 11: 7050(J)
intensity measurement, ionization chamber design for, 11: 5446(J)
internal dose distribution calculated for mice, 11: 8784(J)
ion production in air at atmospheric pressure by, 11: 6960(J)
ionization chamber for dosage measurements, 11: 10180(J)
ionization chamber measurements, design of charge-transfer instrument, 11: 4939(J)
isodose curve determination, 11: 5980(J)
lethal dosage determinations for dogs, 11: 11024
lethal dosage determinations for hamsters, 11: 5160(J)
lethal dosage determinations for monkeys, 11: 6602(J)
lethal effects on bacteria, 11: 33(J)
lethal effects on Habrobracon eggs, modifications induced by oxygen level, 11: 5173(J)
lethal effects on mice, influence of age and growth, 11: 874(J)
lethal effects on mice, influence of divided dose, 11: 6195(J)
lethal effects on mice, influence of physiological strain, 11: 857(J)
localized infections induced in rats by exposure to, 11: 852(J)
lung lesions induced by exposure to, in rats, 11: 38(J)
magnetic centers induced in proteins exposed to, 11: 10029(J)
measurement of 250 to 500 kv, ionization chamber requirements for 11: 4574(J)
mitosis in mouse cornea epithelium exposed to local and distant, 11: 11854(J)
mutagenic effects in mice, 11: 1744(J)
mutations induced in Drosophila by exposure, 11: 844(J), 5148(J), 5149(J), 6605(J)
mutations induced in Habrobracon by exposure, 11: 5147(J)
mutations induced in mice following exposure, 11: 11855(J)
oxidation of ferrous ammonium sulfate solutions by exposure to high doses, 11: 6672(J)
pathological effects, use of β-aminoethylisothiouronium dibromide against lethal total-body exposure in dogs, 11: 11876
pathological effects in rats, 11: 2233(R), 11857(J)
pathological effects in whole-body exposure to, in mice, 11: 11020
pathological effects of, from dental radiography, 11: 5135

X radiation (cont'd)

pathological effects of, modifications produced by stimulation of reticulo-endothelial cells in rabbits, 11: 2237(R)

pathological effects of diagnostic applications in humans, 11: 32(J)

pathological effects of head irradiation, 11: 858(J)

pathological effects of therapeutic doses, 11: 9946(J)

pathological effects on chromosomes of barley, 11: 4241(J)

pathological effects on developing embryos, 11: 9917(J)

pathological effects on esophagus, 11: 6206

pathological effects on eyes in rabbits, 11: 1395

pathological effects on laboratory animals, 11: 4226(R)

pathological effects on protein metabolism in rabbits, 11: 11022(R)

permissible dosage in diagnostic uses, 11: 11842

physiological effects, 11: 8768(J)

physiological effects on mice, 11: 3479(R)

physiological effects on rats, 11: 8795(J)

physiological effects on rats, as demonstrated by uric acid excretion pattern, 11: 42(J)

plant tumors induced by exposure to, 11: 3288(J)

polymerization of resins induced by, 11: 7128(J)

postirradiation creatinuria in rats exposed to, 11: 11874(J)

premortal blood volumes in splenectomized dogs after whole-body exposure to, 11: 11873(J)

protection, 11: 1712(P)

protective effects of isologous bone marrow and antibiotics against supralethal, in mice, 11: 11045(J)

protective effects of rat bone marrow injections against, in mice, 11: 9952(J)

in pulse discharge in light gases, 11: 432(J)

radiosensitivity in adult female mouse, age dependence of, 11: 9942(J)

reactions of temperature control centers in rabbits vaccinated by pyrogenic organisms after total-body exposure to, 11: 851(J)

reciprocity law for, failure in reversal region, 11: 560(J)

reciprocity law for, validity for high-intensity exposures, 11: 559(J)

resistance of thymus lymphocytes to high doses of, 11: 11870(J)

response of spleens in rats, 11: 3292(J)

scattering, thermal, and mechanical treatment effects on, 11: 1896(J)

scattering by liquid metals, 11: 736(J)

scattering by submicroscopic defects at small angles, 11: 12160(J)

scattering from carbon, 11: 2164(J)

scintillation spectrometry of soft, 11: 800(J)

sensitivity of leukemic blood cells, 11: 4794(J)

small angle scattering, collimation corrections, 11: 10352(J)

spectral distribution measurement, 11: 5443(J), 5444(J)

sterilization of mouse ovaries exposed to, evidence for chemical protection, 11: 11046(J)

stimulation of hair growth of rabbits following exposure, 11: 8778(J)

technic and dosimetry for whole-body exposure of patients, 11: 12808

therapeutic uses, effect on general resistance of tumor host, 11: 7080(J)

tumors induced by, 11: 840(J), 5729(J)

tumor induction following exposure of rats, 11: 6610(J)

X-ray beams

from betatron, applications in cancer therapy, 11: 61(J)

calorimetric measurement of 1400 kv, 11: 4587(J)

X-ray beams (cont'd)

physical characteristics of, from 4-Mev linear accelerator, 11: 5461(J)

spectrum analysis by scintillation spectrometry, 11: 4941(J)

X-ray cameras

design and construction of high-temperature, 11: 1563

X-ray-diffraction analysis

equipment for studies at elevated temperatures and high gas pressures, 11: 12121(J)

instrumental factors in, mathematical analysis, 11: 1551(J)

mathematical table of sine functions, 11: 478

methods of superficial layer structure study, 11: 6430(J)

powder assembly for studies at elevated temperatures and high gas pressures, 11: 7279(J)

X-ray diffractometers

design for liquid studies, 11: 8286(R)

instrumental factors, 11: 1551(J)

X-ray equipment

(See also Radiography; X radiation; X-ray-diffraction analysis.)

design for diffraction measurements at temperatures up to 1400°C, 11: 260

design of portable, for application to industrial radiography using Tm^{170}, 11: 5850(J)

tube mount for two-crystal spectrometer, 11: 8980(J)

tubes with mechanically sealed Be windows developed, 11: 1544

X-ray photometry

determination of U in oxides by, 11: 11583

of ores, minerals, and chemical compounds, 11: 4824

X-ray shielding

for installations operating at voltages to 300 kvp, 11: 3619(J)

X-ray sources

(See also Gamma sources.)

industrial uses in radiosterilization of foods, 11: 11023(R)

preparation of Fe^{55} disks, 11: 3933

X-ray spectra

Mn and Cu in Geissler alloy, 11: 1891(J)

X-ray spectrometers

cylinder, intensities obtained, 11: 9(J)

design and application to ferrous metallurgy as an electron probe microanalyser, 11: 6165(J)

design of, for superficial layer structure study, 11: 6430(J)

employing proportional detectors, performance for assay of electron-capture nuclides, 11: 7272(J)

high-temperature micro-thermostat for, 11: 467(J)

recording vacuum, for wave distance of 20 to 300A design, 11: 1968(J)

vacuum tube-shaped, design, 11: 1969(J)

x-ray tube mount for two-crystal, 11: 8980(J)

X-ray spectroscopy

improved methods for, second all-union conference in Inst. of Crystallography, U.S.S.R., Jan.–Feb. 1957, 11: 10789(J)

Xanthates

adsorption on Ag_2S, 11: 4861(R)

Xenon

activation determination in Ag, 11: 4464(R)

Xenon (cont'd)

burnout time, 11: 10987(R)

concentration in HRE, 11: 11801(R)

diffusion in U, 11: 10585

distribution in atmosphere, 11: 8562(R)

formation in fission, pressure buildup by, 11: 8664

lattice constants, 11: 10133(J)

light emission from α-particle stopping, 11: 1274(R)

neutron reactions at 300 Mev, 11: 3580

poisoning in liquid metal fueled reactor and homogeneous aqueous reactor, 11: 4069

poisoning in reactors, transient analysis, 11: 7830

poisoning of nuclear reactors by, mathematical analysis, 11: 2138(J), 5034(J)

production and application, industrial methods, 11: 11263(J)

radiometric analysis, 11: 10114(J)

reactor criticality effects, 11: 13965

reactor criticality effects, tables, 11: 12883

single scattering of 9.8-Mev positrons, 11: 8212(J)

solubility in various solvents, 11: 11566(R)

sparking potential at low pressures, 11: 7231(J)

volume and activity of, produced in homogeneous reactors, 11: 13890

xenon scattering, 11: 739(J)

Xenon isotopes

yield in fast neutron fission of Th^{232}, 11: 11268(J)

Xenon isotopes Xe^{127}

energy levels, 11: 627(J)

Xenon isotopes Xe^{129}

energy levels, 11: 627(J)

Xenon isotopes Xe^{131}

internal conversion, ionization following, 11: 11453(J)

internal-conversion coefficient for 5p electron shell, 11: 9189(R)

production of Xe^{131m}, 11: 8981

spectra, measurement of, 11: 11453(J)

Xenon isotopes Xe^{133}

diffusion from reactor-pure U in temperatures 570 to 1000°C, 11: 5953(J)

gamma spectra, 11: 10114(J)

Xenon isotopes Xe^{135}

criticality effects in intermediate reactors, method for calculating, 11: 9871

escape from neutron-irradiated U-impregnated graphite, 11: 13620

neutron absorption cross sections, 11: 10917

neutron capture cross sections, 11: 13965

neutron cross section as a function of energy, 11: 590(J), 1654(J)

neutron cross section measurement, 11: 12330(R)

neutron cross sections, 11: 1310(J)

neutron cross sections at thermal energies, 11: 9774

nuclear constants of, survey, 11: 8572

poisoning of HRE by, 11: 7857(R)

poisoning of ISHR, 11: 7779

poisoning of TBR core by, effects of radiolytic gas removal on, 11: 7798

Xenon isotopes Xe^{135} (cont'd)

produced by fission, 11: 13965

reactivity effects on MTR with U^{235} and Pu^{239} fuels, 11: 13496

reactor criticality effects, 11: 13965

Xenon isotopes Xe^{137}

beta radiation, maximum energy, 11: 3615(J)

Xenon isotopes Xe^{138}

beta radiation, maximum energy, 11: 3615(J)

Xeroradiography
See Radiography.

Xylene

gas evolution in irradiated, 11: 13968(R)

radiation chemistry, 11: 7291(R)

spectrophotometric analysis for TTA, 11: 8296(R)

Y

Yankee Atomic Electric Co., Boston

progress reports, 11: 4694(R), 5032(R), 6095(R)

Yankee Power Reactor

design description, 11: 10303

fuel loading and control rods, 11: 12247

instrumentation and control, 11: 12246

Yeasts

cell growth and division, Po effect, 11: 2245(R)

inactivation by x radiation at low temperatures, 11: 11034(J)

irradiated, effects of ingested on growth and development of Drosophila, 11: 6597

metabolism of adenine and sulfur amino acids in, 11: 7910(R)

mutagenic actions of cold and x radiation on, 11: 862(J)

mutations induced by exposure to ultraviolet radiation, 11: 7911

radioinduced mutations, 11: 11843

response to ultraviolet and thermal radiations, 11: 4227(R)

Youngs Bend Area (Tenn.)

geophysical exploration, uranium distribution in Chattanooga shale in, 11: 3406

Ytterbium

absorption spectra in $HClO_4$ from 220 to 1400 mμ, 11: 969

distribution between TBP and thorium nitrate–nitric acid solutions, 11: 9589(R)

heat of combustion, 11: 973(J)

heat of sublimation, 11: 4632(R)

magnetic susceptibility from 1.3 to 300°K, 11: 8034(J)

physical and chemical properties, 11: 5816(J)

separation from rare earth oxides by carbon reduction and distillation, 11: 10039(J)

solubility in liquid NH_3, 11: 1474

Ytterbium chlorides

absorption spectrum and magnetic properties, 11: 788(J)

Ytterbium compounds

preparation, crystal structure, and properties of YbN, 11: 1470

thermal and magnetic properties of Yb ethyl sulfate between 20 and 1°K, 11: 10362(J)

Ytterbium isotopes Yb^{168}

gamma spectra, formed in a spallation reaction, 11: 12941

Ytterbium isotopes Yb^{167}

half life, 11: 13114(R)

Ytterbium isotopes Yb^{169}

gamma emission, coincidence studies, 11: 2191(J)

gamma spectra, formed in a spallation reaction, 11: 12941

Ytterbium isotopes Yb^{171}

isomeric transitions, 11: 10363(J)

nuclear spins and magnetic moments, 11: 616(J)

Ytterbium isotopes Yb^{173}

nuclear spins and magnetic moments, 11: 616(J)

Ytterbium isotopes Yb^{175}

gamma cascades in decay of, directional correlation measurements, 11: 3061(J)

nuclear alignment, 11: 12865(J)

Ytterbium isotopes Yb^{177}

decay schemes, 11: 2026(R)

Ytterbium oxides

crystallographic data for Yb_2O_3, 11: 1451

heat of formation, 11: 973(J)

Yttria
See Yttrium oxides.

Yttrium

bone deposition, 11: 13565(R)

bone deposition in rats, 11: 12959(R)

chemical separation from Sr, 11: 7440(R)

chemical separation from Zr, 11: 1475(R)

coprecipitation with bismuth phosphate, 11: 12370

coprecipitation with $Fe(IO_3)_3$ from homogeneous solutions, 11: 2863(J)

geology of major waste producing sites, 11: 1026

heat of combustion, 11: 6757(J)

ion exchange and determination in milk and bone ash, 11: 5255

ion exchange of thiocyanate complexes, 11: 5249(J)

ion exchange using ENTA, 11: 6302(J)

mass spectrometric investigation for existence of new isotopes, 11: 4178(J)

metabolism and pathological effects in dogs, 11: 5133(R)

metabolism in fish, tracer study employing Y^{91}, 11: 6225(J)

neutron cross sections, 11: 4973, 10247

neutron total cross sections, 11: 10229

neutron total cross sections and resonances in kev region, 11: 4047(J)

preparation, 11: 7677(R)

preparation by reduction of Mg–Y alloys, 11: 4454(R)

radiochemical determination, 11: 3708(J)

separation from Eu, 11: 8282(R)

separation from Xenotime sand, 11: 4810(R)

solvent extraction, 11: 7969

solvent extraction from lower lanthanides using TBP, 11: 11115(J)

solvent partition in butex–H_2O–HNO_3, 11: 4359

solvent partition in TBP, 11: 10812(R)

spectrophotometric analysis for Nd, 11: 1443

Yttrium (cont'd)

tissue distribution and excretion in rats, effects of EDTA treatment, 11: 9191(J)

ultrasonic transmission, 11: 11704(R)

Yttrium complexes

with nitrosonaphthol, formation constants, 11: 4301(J)

Yttrium compounds

crystal structure of $NaYF_4$, 11: 12341(R)

Yttrium fluorides

crystallographic data, 11: 6431(J)

preparation by fluorination of yttrium oxide, 11: 4454(R), 7677(R)

preparation from Y_2O_3, 11: 7673(R)

preparation of pure, 11: 11055(R)

Yttrium ions

complexes of Y(III), Y(IV), and Y(V), 11: 8267(R)

Yttrium isotopes

chemical effects on tissues and metabolism in animals, 11: 7055(J)

a search for, by U fission, 11: 2969(J)

Yttrium isotopes Y^{88}

isomeric states, decay scheme, 11: 8119(J)

Yttrium isotopes Y^{89}

gamma reactions (γ,n), cross sections, 11: 3037(J)

Yttrium isotopes Y^{90}

beta emission, 11: 9054(R)

chromatographic separation from Sr^{90}, 11: 4369(J)

effects of injected, on growth of transplanted tumor cells in mice, 11: 7910(R)

industrial applications, 11: 210(J)

radiation dosage determinations, 11: 6574(J)

radiation dosage determinations for, deposited in bones of young rabbits, 11: 2983(J)

radioapplicators, 11: 3320(J)

radiometric determination in the presence of Sr^{90} and Ca^{45}, 11: 7398(R)

separation of carrier-free Y^{90} from Sr^{90} by electrolysis, 11: 8876(J)

toxicology, 11: 893

Yttrium isotopes Y^{91}

bone deposition, 11: 10803(R)

bone deposition in rats following bone fracture, 11: 7695(R)

tissue distribution in rats, effects of cortisone acetate treatments, 11: 7085(J)

toxic effects in mice, 11: 4781(R)

Yttrium isotopes Y^{93}

decay schemes, 11: 4685(R)

Yttrium nitrates

purification, 11: 928

thermolysis, 11: 972(J)

Yttrium nitrides

crystal structure and preparation, 11: 13286(J)

Yttrium oxide–uranium oxide systems
See Uranium oxide–yttrium oxide systems.

Yttrium oxides

crystallographic data for Y_2O_3, 11: 1451

Yttrium oxides (cont'd)

cubic structure and chemical reactions of Y_2O_3, 11: 10526(J)

fluorination for preparation of YF_3, 11: 4454(R)

Yttrium oxyfluorides

crystal structure, electrostatic calculation, 11: 7091(R)

Yttrium sulfates

solubility, 11: 12584(R), 12970(R)

solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)

Yttrocrasites

age determination by the Pb method, 11: 5319(J), 5320(J)

Yttrotungstites

abundance of rare earths in, 11: 10466(J)

Z

Zamboni piles
See Dry batteries.

ZEEP

criticality studies and fuel elements, 11: 13506

design and use, 11: 13(J), 2134(J)

reactivity effect due to neutron streaming in an empty tube, 11: 6919(J)

temperature coefficients of reactivity, 11: 6527

Zeolites
See Anion exchange materials; Cation exchange materials; Ion exchange materials.

ZEPHYR

breeding with thorium envelope, 11: 7321

design and performance, breeder characteristics, and nuclear parameter measurements, 11: 2130(J)

design and uses, 11: 2135(J)

general description, 11: 6930(J)

neutron effectiveness as function of energy in natural U envelope, 11: 9465

neutron flux distribution in core II, 11: 635

neutron flux measurements, 11: 4661

pneumatic transfer system for delayed neutron experiments, 11: 4985(J)

reactivity changes from insertion of various samples, 11: 4660

Zero Energy Tank Reactor (ZETR)
See Critical assemblies.

Zero Power Reactor (Mark I)
See Submarine Thermal Reactor Critical Experiment.

Zinc

activation determination in Al alloys, 11: 1776

anion exchange resin absorption behavior, 11: 5365(R)

coprecipitation with $Fe(IO_3)_3$ from homogeneous solutions, 11: 2863(J)

corrosion by tropical environments, 11: 10538

corrosion products on, bibliography, 11: 3817(J)

dip-coating on U and electroplating with Cu and Cr, 11: 7673(R)

electrodeposition on Th, 11: 13783

fluorescence yield, 11: 4648(J), 5545(J)

gamma radiation from the interaction of 4.4-Mev neutrons, 11: 6856

gamma reactions (γ,n), 11: 704(J)

Zinc (cont'd)

ion exchange behavior on Dowex-50, 11: 5276(J)

ion exchange behavior on Dowex-1 anion exchange resin, 11: 1542(R), 9186(R)

melting temperature at pressures up to 30,000 kg/cm^2, 11: 1533, 3856(J)

neutron elastic scattering in, at 14 Mev, 11: 1642

neutron energy levels, 11: 10232(R)

neutron reactions (n,p), at 14 Mev, 11: 3585(J)

photoneutron yields, 11: 4130(J)

proton reactions (p,n), 11: 13836(R)

radiation effects, 11: 1922(R)

reactions with organic solvent N_2O_4 mixtures, 11: 1025(J)

solubility in $ZnCl_2$ and ZnI_2, 11: 9217(J)

solvent partition, 11: 11563(R)

solvent partition in acetylacetone, 11: 11123

spallation by 340-Mev protons, 11: 2254(R)

thermal capacity, determination between 12 and 320°K, 11: 2920(R)

Zinc (liquid)

solubility of Nb in, 11: 7677(R)

solvent properties for irradiated U and Th, 11: 12490(R)

solvent properties for metals, 11: 12739

Zinc acetates

corrosion inhibition of stainless steel and Al in H_2O, 11: 13868(R)

Zinc alloys

preparation of mercury-free, by amalgamation reactions, 11: 11927(J)

thermoelectric properties, effects of Ag, Sn, Sb, and Bi content on, 11: 1175

Zinc–aluminum alloys
See Aluminum–zinc alloys.

Zinc bromides

colorimetric analysis for Fe, 11: 13267

corrosive effects, 11: 13763(R)

Zinc chloride–potassium chloride systems
See Potassium chloride–zinc chloride systems.

Zinc chlorides

drying, weighing, and packaging of, for use in reduction of ThF_4, 11: 7422

Zinc coatings

for uranium, preparation, 11: 7655(R)

Zinc complexes

with halides, stability in aqueous solutions, 11: 146(J)

with nitrosonaphthol, formation constants, 11: 4301(J)

Zinc compounds

formation and high-temperature properties of $ZnO \cdot 3BeO$, 11: 4428(J)

Zinc crystals

physical properties, 11: 8512(R), 11704(R)

preparation of high-purity, 11: 6387

tensile properties, effect of metal coating on, 11: 6387

Zinc fluorides

preparation by fluorination of ZnO, 11: 8508(R)

Zinc(II) ions

absorption on Dowex-I, 11: 12186(R)

Zinc isotopes

abundance, upper limits, 11: 8983(J)

energy levels from proton inelastic scattering, 11: 10706(J)

neutron cross sections, 11: 2081(J)

neutron reactions (n,p), energy spectrum of protons from, 11: 695(J)

relative abundance in Zn minerals, 11: 5950(J)

Zinc isotopes Zn^{64}

neutron reactions (n,2n), cross sections, 11: 9140(J)

Zinc isotopes Zn^{65}

energy levels, conversion electrons, and branching ratios of, from reaction $Cu^{65}(p,n)$, 11: 12909(J)

gamma spectra, 11: 8216(J)

half life, 11: 6054(J)

K-Auger electron emission, 11: 6570

positrons from, backscattering, 11: 4151(J)

study of K electrons with double focalization spectrometer, 11: 10608(J)

uptake and tissue distribution in clams, 11: 3675

Zinc isotopes Zn^{66}

deuteron reactions (d,2n), excitation function, 11: 12196(J)

neutron reactions (n,p), cross sections, 11: 9140(J)

Zinc isotopes Zn^{67}

electric quadrupole moment, 11: 4637(J)

proton reactions (p,n), 11: 4710(J)

Zinc isotopes Zn^{68}

proton reactions (p,n), 11: 4710(J)

Zinc minerals

relative abundance of Zn isotopes in, 11: 5950(J)

Zinc oxides

corrosion inhibition of stainless steel and Al in H_2O, 11: 13868(R)

radiation effects, 11: 12970(R)

Zinc sulfates

solubility in aqueous UO_2SO_4 solutions, 11: 3777(J)

Zinc sulfide crystals

exhaustion barriers, 11: 9361(J)

preparation and properties for detectors and crystal counters, 11: 1201(R)

Zinc sulfides

(See also Cadmium zinc sulfides.)

oxidation at elevated temperatures, 11: 1766(J)

photoconductivity, effect of d-c fields on, 11: 4488

Zinc–thorium alloys
See Thorium–zinc alloys.

Zinc–uranium alloys
See Uranium–zinc alloys.

Zinc–uranium alloys (liquid)
See Uranium–zinc alloys (liquid).

Zinc–zirconium alloys

constitution diagrams, 11: 11702(R), 11704(R)

corrosion, 11: 11702(R)

mechanical properties, 11: 11702(R)

phase studies, 11: 1877(R), 4454(R), 7673(R), 7676(R), 7677(R), 9325(R), 11703(R)

preparation and properties, 11: 11701(R)

Zinn Fast Reactor
See Experimental Breeder Reactor.

Zippers
See Fasteners.

Zircaloy 1
See Tin–zirconium alloys.

Zircaloy 2
See Tin–zirconium alloys.

Zircaloy A
See Uranium–zirconium alloys.

Zircaloy B
See Uranium–zirconium alloys.

Zircex Process

(Separation of U from U–Zr fuel elements by hydrochlorination to UCl_4 and $ZrCl_4$, and subsequent $ZrCl_4$ distillation.)

chemical flowsheets, 11: 7509(R)

development, 11: 11618, 13682(R)

development of hydrochlorination process, 11: 7139(R)

development studies, 11: 12367

flowsheet and process efficiency, 11: 5270(J)

power reactor fuel processing status report, 11: 7513(R)

reaction rates, 11: 11053(R)

Zirconates

(See also Lead zirconates.)

ferroelectric properties, theory, applications, 11: 6750(J)

Zirconia
See Zirconium oxides.

Zirconium

absorption properties of cold-worked iodide process for H_2, 11: 12898(R)

accident reports at Y-12, May, 1956, 11: 12059

adsorption by LaF_3 or MnO_2, 11: 7520

adsorption on Mo, 11: 7976

affinity toward non-metallic elements, 11: 84(J)

analysis, 11: 13805(R)

analysis for B, by photometric methods, 11: 9590(R)

analysis for Hf, high and low impurities in, 11: 2275

analysis for impurities, 11: 7949

analysis for Mo and Cr, 11: 8517(R)

analysis for O_2, 11: 11587

analysis for O_2 by bromination-carbon reduction method, 11: 921

annealing, 11: 11724

annealing of cold worked, microstructure, 11: 3840

anodic overpotential for oxide-free, 11: 9980

behavior in Na corrosion loop, 11: 7848(R)

behavior in Na systems, hardness profile, 11: 13968(R)

bibliographies, 11: 2512, 6736

bonding of U to, 11: 7673(R)

brazing, 11: 13805(R)

carburization, 11: 9725

chemical base coatings for, lubrication, and surface friction, 11: 2914

chemical determination in Mg alloys, 11: 11089

chemical reaction rates with H_2 and steam at 400°C, 11: 12317(R)

chemical reactions with UO_2, 11: 8720(R)

Zirconium (cont'd)

chemical reactions with H_2O, 11: 13600

chemical reactions with H_2O, effect of H formed and metal lost, 11: 2253

chemical reactions with water at high temperatures, 11: 14003

chlorination of, heat removal calculations, 11: 13585

coated with phosphate and proprietary lube, 11: 7646(R)

coating, 11: 348(J)

coating, effect of ball-milling on, 11: 16088

cold drawing of extruded and pierced tubing and resistance welding of roll-formed tubing, 11: 7626(R)

colorimetric determination, 11: 8285(R)

colorimetric determination in trace analyses, 11: 11940(J)

compacting into consumable electrodes, 11: 2537

conductometric determination, 11: 2826

corrosion, 11: 348(J), 7857(R), 7858(R), 8631, 11682(R), 12473(R), 12584(R), 13063(R), 13197(R)

corrosion, comparison of graphite-melted in as-cast and extruded states, 11: 8517(R)

corrosion, effects of Nb and Ta additions on, 11: 10873

corrosion, mechanism of, 11: 8462(R), 10887(R), 11689(R), 12317(R)

corrosion, mechanism of aqueous, 11: 7630(R)

corrosion and oxidation of, mechanism, 11: 10090

corrosion by biphenyl, 11: 2898; 5310

corrosion by $CuSO_4-H_2SO_4-UO_2SO_4$ systems, 11: 10529, 12460

corrosion by distilled water at 200 and 300°C, 11: 10078

corrosion by high temperature high purity H_2O, 11: 2903(J)

corrosion by high-temperature water, 11: 10881, 13067(R)

corrosion by hot water, 11: 13075(R), 13767(R)

corrosion by hot water and steam, 11: 13782(R)

corrosion by liquid NaK, 11: 1129, 7727, 13746

corrosion by liquid Th–Mg alloys, 11: 11703(R)

corrosion by reactor control poisons, 11: 9716

corrosion by reactor fuel solution in in-pile loop, 11: 12898(R)

corrosion by reactor slurries, 11: 9722

corrosion by reactor solutions, 11: 6536(R), 8449, 8706(R)

corrosion by Na at 900°F, 11: 227

corrosion by steam and water, effects of alloying elements on, 11: 2489

corrosion by H_2SO_4, 11: 3809(R)

corrosion by 350°F H_2O and 750°F steam, effects of inhibiting agents and impurities on, 11: 8516(R)

corrosion by ThO_2 slurries, 11: 1074, 4692(R)

corrosion by uranyl fluoride, 11: 13057

corrosion by UO_2SO_4, 11: 8708(R)

corrosion by $UO_2SO_4-Li_2SO_4$, 11: 13745

corrosion by water, 11: 8716(R), 8718(R), 9859, 10888(R), 10899(R), 13059(R), 13060(R), 13062(R), 13069(R), 13070(R), 13071(R), 13746, 13768(R)

corrosion by water, effects of radiation on, 11: 8715(R)

corrosion by water at 300°C, 11: 13838(R)

corrosion by water containing H_2O_2, 11: 8705(R)

corrosion films on, thickness, 11: 11685

corrosion in homogeneous reactors, 11: 13982(R)

Zirconium (cont'd)

corrosion of crystal bar, in organic coolants, 11: 13752

corrosion of irradiated, in 264°C H_2O, 11: 14020(R)

corrosion of reactor fuel elements, effect of test conditions, 11: 13760

corrosion of H_2SO_4 treated, in 300°C water, 11: 7677(R)

corrosion products on, bibliography, 11: 3817(J)

corrosion resistance, 11: 11801(R), 13326(J)

corrosion resistance to 600°F water and 750°F steam, effect of alloy additions on, 11: 8517(R)

corrosion test procedure for crystal bar, 11: 7622

corrosion testing, H_2 pickup during, 11: 13056

corrosion testing specifications, 11: 1073

corrosion tests at elevated temperatures, 11: 1870

creep properties of annealed, 11: 11725

creep test for tensile specimen, proposal, 11: 2506

crystal lattice constants, effect of O_2 additions on, 11: 8516(R)

crystal structure of, preferred orientation in uniskanned, 11: 3841

deposition from homogeneous reactor feed solution, 11: 12321(R)

determination in homogeneous reactor solutions, 11: 4292(J), 10974

determination in Thorex Process streams, 11: 3697

diffusion (bond effects), 11: 9326

diffusion from U-impregnated graphite, 11: 12982

diffusion of O_2 in, 11: 10090

dimensional stability of moderator can, under thermal cycling, 11: 4095(R)

disposal, handling, safety, and storage, code of practice, 11: 12050

dissolution in HF solutions, low-hafnium, 11: 13517(J)

dissolution by HF, H_2SO_4, HNO_3 and HCl, 11: 4470(J)

dissolution in fused fluoride baths, 11: 4392, 11052

dissolution in liquid BrF_3, 11: 7407(R)

dusts and fumes from, pathological effects on lungs, 11: 895(J)

drawing, 11: 2498

effects on tissue distribution of Pu injected in rats, 11: 5754(J)

electrodeposition, phase diagrams of melts for, 11: 2929(J)

electrodeposition from nonaqueous media, 11: 1898(J), 2505(R), 3863(J)

electrodeposition from ternary system, 11: 2502(R), 2503(R), 2504(R)

electrodeposition in chloride solutions, 11: 2501(R)

electrolytic reduction from aqueous solutions and fused salts, 11: 11578(R)

explosive limits, ignition, impact tests, and safety, 11: 11913(R)

extrusion, 11: 2498, 8515(R)

extrusion of, for PWR fuel elements, 11: 8717(R)

fabrication of crystal bar, by de Boer process, 11: 4450

fatigue notch sensitivity, 11: 2527

finishing, 11: 2498

fire and explosion hazard, evaluation, 11: 1128

fatigue of, exposed to Na, 11: 4095(R)

fluorometric determination, 11: 7115(J)

forging and rolling, 11: 9732

fusion-welding for a nuclear reactor, 11: 373(J)

gamma rays from neutron inelastic scattering, 11: 3592

Zirconium (cont'd)

gasometric analysis for H_2, N_2, and O_2, 11: 3339

grain growth, 11: 9478(R)

grain growth, effects of strain and temperature on, 11: 9331

grain growth of swaged crystal bar, 11: 1162(J)

gravimetric analysis for Ba, 11: 5780

gravimetric determination, 11: 4304(J)

gravimetric determination using 1-naphthylglycolic acid, 11: 1446

grinding, 11: 1154(J)

hafnium separation by hexone–thiocyanate solvent extraction, 11: 12412

Hall effect measurement in, 11: 5342

handling and storage, 11: 12059

hardness, 11: 8512(R)

hardness, effect of O_2 additions on, 11: 8516(R)

heat capacity measurement, 11: 5342

heat treatment, 11: 12317(R)

high temperature and nuclear properties, for use in Na-cooled reactors, 11: 13516(J)

hydridation and grain growth in O_2–H_2 recombiner loop, 11: 9721

hydrogen embrittlement, 11: 5309, 8520(R)

impact tests, 11: 13060(R)

interdiffusion between Mg, 11: 9326

ion exchange, fission fragment analysis, 11: 3702

ion exchange separation from Hf in F^- solutions, 11: 2353(R)

ion exchange separation from Nb and Hf, 11: 8282(R)

ion migration during oxidation, 11: 4482(J)

ionization potential difference and variable valence, 11: 11071(J)

K fluorescence yield, 11: 5545(J)

liquid metal extraction from Cr–U alloys, 11: 7677(R)

low-pressure solubility and diffusion of H in, 11: 5909(J)

mass transfer in liquid NaK loops, 11: 6719

mechanical properties, 11: 8718(R), 13805(R)

mechanical properties, effect of annealing on, 11: 3840, 13822

mechanical properties, effects of heat treatment on, 11: 6365

mechanical properties, effects of H on, 11: 5909(J)

mechanical properties, effects of H_2, O_2, N_2, and CO_2 on thermal and thermodynamic properties, 11: 3419

mechanical properties, effect of liquid Na on, 11: 9330

mechanical properties, effects of neutron irradiation on, 11: 761, 8930(J)

mechanical properties of annealed and cold-worked, 11: 13779(R)

melting, 11: 8515(R), 13059(R)

melting by "auto-crucible" method, 11: 8516(R), 8517(R)

melting point, 11: 8517(R)

melting technique development, 11: 13061(R)

metallography, 11: 11723, 12339(R)

metallurgy, 11: 7692(R), 7858(R)

method and apparatus for obtaining ductile, 11: 8248(P)

microstructure of annealed, 11: 13822

neutron activation, for reactor flux measurements, 11: 12519

neutron capture cross sections, 11: 11740(R)

neutron cross sections, multigroup, 11: 12284

Zirconium (cont'd)

neutron inelastic scattering cross sections, 11: 2160

neutron inelastic scattering cross sections at 14 Mev, 11: 2628

neutron reactions (n,γ), 11: 13209

neutron reactions (n,p), at 14 Mev, 11: 3585(J)

neutron scattering at 4.4 Mev, 11: 6856

neutron scattering at 2.5 and 7.0 Mev, 11: 3035(J)

oxidation at low potentials, effect of electrolyte composition, 11: 7183

oxidation between 400 and 800°C, vacuum microbalance method, 11: 5898(J)

oxidation of powdered, kinetics, 11: 3806

oxidation in high-temperature water, 11: 10881

oxidation testing by heating in air, 11: 1078

oxide film removal by heating, 11: 5355(J)

photometric determination, highly selective method for, 11: 11930(J)

physical properties, 7858(R), 8515(R)

plastic deformation of swaged crystal bar, 11: 1162(J)

plating out of Ra daughters from ThO_2 slurries, 11: 6405(J)

potentiometric analysis for chloride, 11: 2280

powder metallurgy, 11: 13802

powder metallurgy, compacting and sintering characteristics, 11: 10897

precipitation and recovery pilot plant, 11: 2247

precipitation as the phthalate from impurities, 11: 9981

preparation by bomb-reduction, 11: 11701(R)

preparation by bomb reduction of ZrF_4, 11: 11703(R)

preparation by Mg reduction of ZrF_4, 11: 312

preparation by zirconium fluoride reduction and separation from Hf, 11: 8508(R)

production, 11: 203(J), 5331, 10899(R), 12322(R), 13059(R), 13063(R), 13065(R), 13066(R), 13072(R), 13075(R), 13767(R), 13768(R)

production by Ca or Mg reduction of the halides and oxides, 11: 1538(R), 1810(R), 2420

production by fused-salt electrolysis, 11: 2512, 2513(R), 2514, 2515, 2516

production by hot-wire process, 11: 2525

production by iodine decomposition, waste recovery during, 11: 2535

production by reduction of tetrahalide with reducing metal, 11: 11509(P)

production of low-Hf, 11: 7551(R)

production plant at Y-12, description, 11: 12412

production report, 11: 10888, 13060(R), 13061(R), 13062(R), 13069(R), 13070(R), 13071(R), 13074(R)

properties, 11: 5331, 6398

properties, evaluation as high-temperature high-pressure process tube and slug jacket material, 11: 11193

purification, 11: 13059(R)

purification, floating zone, 11: 12456(R)

purification by dissociation of ZrI_4, 11: 8020(J)

purification by ion exchange, 11: 6299(J)

purification by phthalate precipitation, 11: 12412

purification by zone refining, 11: 1900(J)

purification pilot plant, operation, 11: 2490

purification with pulse columns, 11: 13008

pyrophoricity, 11: 2934(J)

radiation damage, 11: 1167(J)

Zirconium (cont'd)

radiation effects, 11: 8747(R)

radiation effects on electrochemical activity, 11: 10461(J)

radiation effects on hardness, 11: 13868(R)

radiation effects on hardness and electrical resistivity of annealed and 96% cold-worked crystal bar, 11: 10900

radiation effects on properties of, 11: 13205

radiometric titration, 11: 13277(J)

reactions with high-temperature water, 11: 2511, 3394(R), 4875, 5330(R), 13582(R)

reaction with N_2, 11: 13582(R)

reactions with H_2O, thermodynamics, 11: 12059

reaction with water vapor at subatmospheric pressures, 11: 7939(J)

reclamation, 11: 10899(R)

reclamation of lathe turnings, 11: 8512(R), 11704(R)

recovery from aqueous raffinate from irradiated-U processing, 11: 11506(P)

recovery from Redox waste, 11: 7430(R)

recrystallization diagram for iodide, deformation studies, 11: 6432(J)

recrystallization of swaged crystal bar, 11: 1162(J)

reduction with C and Si from oxides, 11: 1151(J)

refining, 11: 348(J)

refining by iodide process, 11: 371(J)

removal cross sections for fast effect, calculations in water–U lattices with Xf Zr used as a clad, 11: 2628

removal from Redox feed solutions by Super Filtrol scavenging, 11: 8373

rocking, 11: 2498

rolling and welding into Hanford-type process tubes, 11: 13764

safety procedures for handling scrap, 11: 10579(J)

sampling for analysis, 11: 7949

scaling at elevated temperatures, 11: 1873(R), 3393(R), 5874(R)

scaling in air and O_2 at elevated temperatures, 11: 10528(R)

separation, 11: 203(J)

separation from Hf, 11: 1810(R), 1826, 2354, 3366(J), 4454, 6682, 7677(R), 8507(R), 11578(R), 12378

separation from Hf, filtration of HCNS condensation products in, 11: 11639

separation from Hf, recovery of spent silica gel from, 11: 8510(R)

separation from Hf by adsorption, 11: 7428(R)

separation from Hf by distillation, 11: 13575(R)

separation from Hf by solvent extraction, 11: 7673(R), 11642, 11703(R), 11704(R)

separation from Hf by solvent extraction with di(2-ethylhexyl) phosphoric acid, 11: 10036(R)

separation from Hf by solvent extraction with TBP–ether systems, 11: 7532

separation from Ni, Cr, and Cu by selective precipitation, 11: 3633(P)

separation from Ta, Mo and W, 11: 3703

separation of, and Th by paper chromatography, 11: 11988(J)

separation of Mo and, from U with Ag, 11: 8512(R)

separation of Ta from, by precipitation with N-benzoyl-N-phenyl-hydroxylamine, 11: 7951(J)

solubility in liquid Bi, 11: 7691(R)

solubility in H_2SO_4, 11: 12966(R)

solubility in U, 11: 8462(R)

Zirconium (cont'd)

solvent extraction, 11: 7969, 8283(R)

solvent extraction by TBP–HCl and TBP–HNO_3 systems, 11: 1000(J)

solvent extraction from $Ca(NO_3)_2$–$ZrO(NO_3)_2$–HNO_3 solutions with TBP, 11: 3747

solvent extraction from HNO_3 solutions with TBP, effects of H_3PO_4 on, 11: 13666

solvent extraction with TTA from HCl solutions, 11: 12339(R)

solvent partition between hexone and HNO_3–$Ca(NO_3)_2$ solutions, 11: 6685(J)

solvent partition in acetylacetone, 11: 11123

solvent partition in butex–NH_4NO_3 and butex–H_2O–HNO_3, 11: 4359

sorption on Dowex-1 and elution with HCl–HF solutions, 11: 12339(R)

spallation products, 11: 13197(R)

spatial distribution of thermal neutrons in mixtures of, and water, 11: 2619

spectrographic determination, standards for, 11: 922

spectrophotometric analysis for N, 11: 12676

spectrophotometric analysis for W using dithiol, 11: 7950(J)

spectrophotometric determination, 11: 8296(R)

spectrophotometric determination in homogeneous reactor solution, 11: 8285(R)

spectrophotometric determination in plutonium alloys, 11: 5784(J)

spectrophotometric determination with SPADNS, 11: 4299(J)

swaging, 11: 2498

tensile properties, 11: 1129, 4095(R), 8687(R), 12473(R), 13969(R)

tensile properties of β-quenched, 11: 8715(R)

therapeutic uses in plutonium poisoning, 11: 893

thermal cycling and electroplating by Cu, 11: 7673(R)

thermal expansion, 11: 13805(R)

thermodynamic properties, 11: 10563

vacuum fusion analysis for O_2, N_2, and H_2, 11: 4308(J)

valency determination from intermetallic compound structure, 11: 4885(R)

volumetric analysis for Sn, 11: 13269(J)

volumetric determination in Ce–Zr alloys, 11: 3693

weight gains in Na systems, 11: 4095(R), 13969(R)

welding, 11: 2498, 7846(R), 13805(R)

welding of graphite moderator cladding, 11: 8687(R)

welding strength, 11: 8688(R)

welding to Zr, 11: 8687(R)

wetting by molten Pb or Bi, treatment for, 11: 3247(P)

Zirconium (Cu clad)

extrusion, alloying during, 11: 8524(R)

Zirconium (liquid)

high-temperature reactions with H_2O, 11: 3835(R), 4448(R), 8916(R), 13574(R)

chemical reaction tests in MTR, 11: 12968

Zirconium alloys

alloying characteristics, summary of reports on, 11: 1132(R)

analysis, 11: 13069(R)

analysis for impurities, 11: 7949

anodic oxidation of dilute binary, 11: 5859

anodizing as metallographic technique for, 11: 7198

Zirconium alloys (cont'd)

burnout studies in rectangular vertical tubes of zircaloy, 11: 12444

corrosion, 11: 7858(R), 10986(R), 12473(R), 13072(R), 13073(R)

corrosion, comparison of graphite-melted in as-cast and extruded states, 11: 8517(R)

corrosion and development, 11: 6536(R)

corrosion by high-temperature water, 11: 13066(R)

corrosion by hot water, 11: 13075(R), 13767(R)

corrosion by hot water and steam, 11: 13782(R)

corrosion by 900°F steam, 11: 8517(R)

corrosion by 600°F water and 800°F steam, 11: 8518(R)

corrosion by Na, 11: 1129

corrosion by NaK and water, 11: 13746

corrosion by steam and air, 11: 10923(R)

corrosion by steam and water, effects of alloying elements on, 11: 2489

corrosion by ThO_2 slurries, 11: 4692(R)

corrosion by UO_2SO_4, 11: 6348(R), 7859(R), 8708(R), 8911

corrosion by uranyl sulfate solution, binary and ternary with Cr, Si, Mo, Nb, and V, 11: 12898(R)

corrosion by UO_2SO_4, ThO_2 slurries, and mineral acids and in-pile corrosion, 11: 9869(R)

corrosion by water, 11: 8717(R), 8718(R), 10888(R), 13061(R), 13062(R), 13069(R), 13070(R), 13071(R), 13074(R), 13768(R), 13779(R)

corrosion by water at 650°F, 11: 13063(R), 13064(R), 13068(R)

corrosion of welded, by water at 500°F, 11: 13864(R)

corrosion resistance of, effects of heat treatment, 11: 9717

corrosion resistance of graphite-melted, 11: 8519(R)

corrosion tests at elevated temperatures, 11: 1870

crystal structure, 11: 13805(R)

development of corrosion-resistant, 11: 4692(R), 7393(P)

diffusion of O_2 in, 11: 10090

disposal, handling, safety, and storage, code of practice, 11: 12050

dissolution in a fluoride melt, 11: 4392

electrical resistivity, 11: 12490(R)

hardness, 11: 13065(R)

hydridation, 11: 12473(R)

hydridation and grain growth in O_2–H_2 recombiner loop, 11: 9721

impact testing, 11: 9869(R)

mechanical properties, 11: 8718(R), 13061(R)

mechanical properties, effect of alloying elements on, 11: 3419

mechanical properties, effect of cold work on, 11: 8715(R)

metallography, 11: 11723

microstructure, 11: 7198

oxidation of arc and graphite melted, 11: 13582(R)

paramagnetic susceptibility, 11: 4885(R)

phase studies, 11: 7198

preparation of thermosetting, 11: 6590(P)

production, 11: 11700(R), 13065(R), 13073(R)

production by reduction of tetrahalide with reducing metal, 11: 11509(P)

production report, 11: 10888(R), 13071(R)

reactions with high-temperature water and UO_2SO_4 solutions, 11: 11697

reduction with C and Si from oxides, effect of Mo, W, Cr, Al, Mn, and Ni on, 11: 1151(J)

strength, effect of β-ω age hardening on, 11: 1170(J)

Zirconium alloys (cont'd)

tensile properties, 11: 1129

thermal conductivity, 11: 12490(R)

valency, 11: 4885(R)

volumetric analysis for Sn, 11: 13269(J)

Zirconium–aluminum alloys
See Aluminum–zirconium alloys.

Zirconium–aluminum–niobium alloys
See Aluminum–niobium–zirconium alloys.

Zirconium–aluminum–tin alloys
See Aluminum–tin–zirconium alloys.

Zirconium–antimony alloys
See Antimony–zirconium alloys.

Zirconium–beryllium–uranium alloys
See Beryllium–uranium–zirconium alloys.

Zirconium–biphenyl systems
See Biphenyl–zirconium systems.

Zirconium–bismuth alloys (liquid)
See Bismuth–zirconium alloys (liquid).

Zirconium borides

(See also specific systems which contain boron and zirconium.)

dimensional stability and tensile properties, radiation effects on, 11: 13625

stability, effects of air, O_2, and N_2, on, 11: 5857(R)

Zirconium–boron–silicon systems
See Boron–silicon–zirconium systems.

Zirconium–boron systems
See Boron–zirconium systems.

Zirconium–boron–tin systems
See Boron–tin–zirconium systems.

Zirconium carbides

(See also specific systems which contain carbon and zirconium.)

hot pressed, gas-turbine application, physical properties, 11: 1065

preparation and chemical and physical properties, 11: 11182(J)

preparation from ZrO_2, 11: 84(J)

Zirconium–carbon systems
See Carbon–zirconium systems.

Zirconium–cerium alloys
See Cerium–zirconium alloys.

Zirconium chloride complexes

corrosive effects, 11: 2278(R)

molecular properties, 11: 12970(R)

with phosphoryl chloride, density and surface tension, 11: 13576(R)

vapor density of $ZrCl_4 \cdot POCl_3$, 11: 13577(R)

Zirconium chloride–potassium chloride–sodium chloride systems
See Potassium chloride–sodium chloride–zirconium chloride systems.

Zirconium chloride–potassium chloride systems
See Potassium chloride–zirconium chloride systems.

Zirconium chloride–sodium chloride systems
See Sodium chloride–zirconium chloride systems.

Zirconium chlorides

corrosive effects, 11: 13059(R)

electrolysis in dimethyl formamide and acetonitrile, 11: 2501(R)

electrolysis with Pt cathodes and Zr anodes, 11: 2502(R)

engineering record book of Zr chloride plant, 11: 10809

reduction, 11: 13059(R)

Zirconium chlorides (cont'd)

solubility and conductivity in tetrahydrofuran, benzophenone, and morpholine, 11: 2501(R)

solubility in organic solvents, 11: 2502(R)

vapor condensation, apparatus, 11: 2248

vapor pressure, 11: 2278(R)

Zirconium–chromium alloys
See Chromium–zirconium alloys.

Zirconium cladding

(See also Silicon–uranium systems (Zr clad); Uranium (Zr clad); Uranium–zirconium alloys (Zr clad).)

extrusion, 11: 7650

on uranium, diffusion, 11: 13782(R)

Zirconium coatings

deposition on U, by metal-arc spraying in inert atmospheres, 11: 13076

deposition on U, iodide decomposition process for, 11: 13084

deposition on U by electrolysis, 11: 11504(P)

preparation by electrophoretic deposition, 11: 8514(R)

vapor deposition on U, 11: 13778

vapor deposition on U and corrosion of, 11: 13776

Zirconium compacts

resistance sintering and properties, 11: 12500

Zirconium complexes

with chloride, anion exchange, 11: 2254(R)

conductivity studies of non-aqueous, 11: 2505(R)

electrolysis of Zr from, 11: 2504(R)

preparation of, for electrolysis of Zr, 11: 2504(R)

Zirconium compounds

electrodeposition of Zr from, 11: 3863(J)

fused-salt electrolysis, 11: 2512

gravimetric analysis for Ba, 11: 5780

preparation and properties of zirconium peroxide, 11: 3687(J)

properties of mannitozirconic acid, 11: 11064(J)

thermolysis of organic salts, 11: 4304(J)

Zirconium conferences

on corrosion of Zr and Zr alloys, 11: 2489

Zirconium crucibles

preparation, 11: 2512

Zirconium crystals

slip and twinning planes, 11: 12499(R)

Zirconium fluoride–lithium fluoride–sodium fluoride systems
See Lithium fluoride–sodium fluoride–zirconium fluoride systems.

Zirconium fluoride–sodium fluoride systems
See Sodium fluoride–zirconium fluoride systems.

Zirconium fluoride–sodium fluoride systems (liquid)
See Sodium fluoride–zirconium fluoride systems (liquid).

Zirconium fluoride–sodium fluoride–uranium(IV) fluoride systems (liquid)
See Sodium fluoride–uranium(IV) fluoride–zirconium fluoride systems (liquid).

Zirconium fluorides

bomb reduction, 11: 8507(R), 11703(R)

co-reduction with UF_4 for preparation of U–Zr alloys, 11: 8528

crystal structure of, x-ray-diffraction analysis, 11: 412

Zirconium fluorides (cont'd)

preparation, 11: 8508(R)

preparation and sublimation, 11: 7089

preparation by reaction of HF with $ZrOCl_2 \cdot 8H_2O$, 11: 8507(R)

preparation from $ZrO(OH)_2$ and $ZrCl_4$, 11: 11703(R)

reduction to Zr by Mg, 11: 312, 2420(R)

spectral bands assigned to, 11: 10271(J)

Zirconium–germanium alloys
See Germanium–zirconium alloys.

Zirconium halides

reduction to Zr with alkali metals, 11: 11509(P)

Zirconium hydrides

(See also Hydrogen–zirconium systems.)

formation, 11: 7861(R)

preparation, 11: 13805(R)

preparation by hydridation of sponge at 400°C, 11: 12499(R)

Zirconium–hydrofluoric acid systems
See Hydrofluoric acid–zirconium systems.

Zirconium–hydrogen systems
See Hydrogen–zirconium systems.

Zirconium hydroxides

adsorptive properties for ions in aqueous solutions, 11: 9869(R)

precipitation from fluozirconate solutions, 11: 2354

Zirconium–indium alloys
See Indium–zirconium alloys.

Zirconium ions

hydrolytic polymerization, 11: 9587(R)

Zirconium–iron alloys
See Iron–zirconium alloys.

Zirconium isotopes

Coulomb excitation by alpha bombardment, 11: 9189(R)

decay properties, 11: 9591(R)

energy levels, 11: 10247

neutron reactions (n,p), relative cross sections, 11: 5561(J)

neutron scattering data, 11: 10229

Zirconium isotopes Zr^{89}

tissue distribution following intravenous administration in man, 11: 6227(J)

Zirconium isotopes Zr^{90}

electric monopole transition and β^+ spectrum, 11: 3512(J), 5541(J)

neutron scattering cross sections, 11: 7713

Zirconium isotopes Zr^{91}

spin and magnetic moment, 11: 6062

Zirconium isotopes Zr^{92}

energy levels, 11: 3592

gamma reactions (γ,n), cross sections, 11: 3037(J)

Zirconium isotopes Zr^{93}

decay scheme for, 11: 7405(R), 9579(R)

thermal neutron cross section, 11: 7713

Zirconium isotopes Zr^{94}

energy levels, 11: 3592

neutron activation cross section, 11: 13868(R)

Zirconium isotopes Zr^{95}

correlation between β and circularly polarized γ rays in, measurement, 11: 13485(J)

Zirconium isotopes Zr^{95} (cont'd)

detection and measurement in plants, 11: 11048(J)

fission monitor for U^{235}, 11: 12503

high-temperature separation from Nb^{95}, 11: 5252

poisoning effects in thermal homogeneous reactor core, 11: 8601

radiometric determination, 11: 8792(R)

Zirconium isotopes Zr^{96}

neutron activation cross section, 11: 13868(R)

Zirconium isotopes Zr^{97}

decay properties, 11: 774(J)

decay scheme, 11: 3610(J), 5070(J)

formation, 11: 8722

Zirconium–magnesium–thorium alloys
See Magnesium–thorium–zirconium alloys.

Zirconium minerals

(See also Zirconium ores.)

analysis, 11: 13070(R), 13072(R), 13074(R)

analysis for Hf, 11: 10888(R)

analysis of high-purity concentrates for high-Hf content, 11: 13767(R)

production and corrosion, 11: 13073(R)

Zirconium–molybdenum alloys
See Molybdenum–zirconium alloys.

Zirconium–molybdenum–tin alloys
See Molybdenum–tin–zirconium alloys.

Zirconium–molybdenum–uranium alloys
See Molybdenum–uranium–zirconium alloys.

Zirconium–nickel alloys
See Nickel–zirconium alloys.

Zirconium–niobium alloys
See Niobium–zirconium alloys.

Zirconium–niobium–tin alloys
See Niobium–tin–zirconium alloys.

Zirconium–niobium–tin–uranium alloys
See Niobium–tin–uranium–zirconium alloys.

Zirconium–niobium–uranium alloys
See Niobium–uranium–zirconium alloys.

Zirconium–niobium–uranium alloys (clad)
See Niobium–uranium–zirconium alloys (clad).

Zirconium nitrates

solvent extraction using TBP, 11: 6303(J)

Zirconium nitrides

(See also specific systems which contain nitrogen and zirconium.)

preparation from ZrO_2, 11: 84(J)

Zirconium ores

caustic leaching, 11: 13062(R)

occurrence, 11: 5331

processing for Zr recovery, 11: 8507(R)

Zirconium oxide–carbon systems
See Carbon–zirconium oxide systems.

Zirconium oxide crucibles

contamination of molten Th by, 11: 12493

fabrication and thermal stability, 11: 5892

Zirconium oxide films

dissolution of, on Zr, 11: 5355(J)

thickness estimation from potential measurements, 11: 9980

Zirconium oxide–silicon oxide–titanium oxide systems
See Silicon oxide–titanium oxide–zirconium oxide systems.

Zirconium oxide–thorium oxide systems
See Thorium oxide–zirconium oxide systems.

Zirconium oxide–titanium oxide systems
See Titanium oxide–zirconium oxide systems.

Zirconium oxide–titanium systems
See Titanium–zirconium oxide systems.

Zirconium oxide–uranium oxide systems
See Uranium oxide–zirconium oxide systems.

Zirconium oxides

(See also specific systems containing oxygen and zirconium.)

chlorination for production of Zr, 11: 10899(R)

chlorination of purified, 11: 7432

deposition in homogeneous reactor processing loop, 11: 12993(R)

emissivity, 11: 4875

evaporation, gaseous species in, 11: 550(R)

fluorination to ZrF_4, 11: 7089

hot pressed, gas-turbine application, physical properties, 11: 1065

interfacial reactions with Ce and La, 11: 2851

preparation, 11: 922

production of low-Hf, 11: 7551(R)

radiation stability, 11: 12456(R)

rotational analysis of singlet system B, 11: 6972(J)

spectral determination of Cd, Zn, Tl, Sb, Bi, Ni, Ba, Na, and K by evaporation in, 11: 7119(J)

spectrographic analysis for Hf, 11: 13578(R)

thermal expansion, 11: 12794

Zirconium oxychlorides
See Zirconyl chlorides.

Zirconium–oxygen systems
See Oxygen–zirconium systems.

Zirconium–oxygen–tin systems
See Oxygen–tin–zirconium systems.

Zirconium–oxygen–titanium systems
See Oxygen–titanium–zirconium systems.

Zirconium phosphates

adsorptive properties, and separation of Pu from fission products by, 11: 11619

adsorptive properties for ions in aqueous solutions, 11: 9869(R)

adsorptive properties for Pu, 11: 13024(R)

Zirconium–plutonium alloys
See Plutonium–zirconium alloys.

Zirconium powders

desensitization, particle size distribution, fractionation, and spark sensitivity, 11: 3833(R)

explosive limits, handling, safety, and toxicology, 11: 6741

preparation, 11: 2512

production, 11: 7638, 13802

Zirconium silicates

(See also Zircons.)

hot pressed, gas-turbine application, physical properties, 11: 1065

Zirconium–silver alloys
See Silver–zirconium alloys.

Zirconium–sodium fluoride systems
See Sodium fluoride–zirconium systems.

Zirconium–stainless steel–tin compacts
See Stainless steel–tin–zirconium compacts.

Zirconium sulfates
solubility, 11: 12584(R)

Zirconium–tantalum alloys
See Tantalum–zirconium alloys.

Zirconium–tantalum–tin alloys
See Tantalum–tin–zirconium alloys.

Zirconium–tantalum–uranium alloys
See Tantalum–uranium–zirconium alloys.

Zirconium–thorium alloys
See Thorium–zirconium alloys.

Zirconium–thorium oxide systems
See Thorium oxide–zirconium systems.

Zirconium–tin alloy–stainless steel compacts
See Stainless steel–tin–zirconium alloy compacts.

Zirconium–tin alloy–stainless steel couples
See Stainless steel–tin–zirconium alloy couples.

Zirconium–tin alloys
See Tin–zirconium alloys.

Zirconium–tin alloys (liquid)
See Tin–zirconium alloys (liquid).

Zirconium–tin–titanium alloys
See Tin–titanium–zirconium alloys.

Zirconium–tin–uranium alloys
See Tin–uranium–zirconium alloys.

Zirconium–titanium alloys
See Titanium–zirconium alloys.

Zirconium–titanium–uranium alloys
See Titanium–uranium–zirconium alloys.

Zirconium–tungsten alloys
See Tungsten–zirconium alloys.

Zirconium–uranium alloys
See Uranium–zirconium alloys.

Zirconium–uranium alloys (clad)
See Uranium–zirconium alloys (clad).

Zirconium–uranium alloys (liquid)
See Uranium–zirconium alloys (liquid).

Zirconium–uranium alloys (Zr alloy clad)
See Uranium–zirconium alloys (Zr alloy clad).

Zirconium–uranium alloys (Zr clad)
See Uranium–zirconium alloys (Zr clad).

Zirconium–uranium compacts
See Uranium–zirconium compacts.

Zirconium–uranium couples
See Uranium–zirconium couples.

Zirconium–uranium oxide systems
See Uranium oxide–zirconium systems.

Zirconium–vanadium alloys
See Vanadium–zirconium alloys.

Zirconium–water systems
See Water–zirconium systems.

Zirconium–zinc alloys
See Zinc–zirconium alloys.

Zircons
(See also Zirconium silicates.)
radiation damage and age measurements, 11: 5374(J)
radiation damage in, as basis of method for age measurement, 11: 8001(J)

Zirconyl chlorides
chemical and physical properties, 11: 13059(R)
production report, 11: 13060(R)

Zirconyl nitrates
thermolysis, 11: 972(J)

Zone melting
See High temperature separation processes.

ZPR-I Reactor
See Submarine Thermal Reactor Critical Experiment.

ZPR-III Reactor
See Critical assemblies; Power breeder reactors.

Zyglo
See Dyes.

NUMERICAL INDEX OF REPORTS

With Availability Information for Official Atomic Energy Reports.

The Numerical Index of Reports is divided into two parts: Part I—all AEC reports abstracted or listed in *NSA* Vol. 11 (1957), together with those AEC reports which were published in the open literature and consequently unavailable in report form; Part II—non-AEC reports, which should not be requested from the Technical Information Service Extension.

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Nuclear Science Abstracts, Vol. 7, No. 24A, Dec. 31, 1953, includes a cumulated Numerical Index of Reports covering all reports in *Abstracts of Declassified Documents (ADD)* and in *NSA*, Vols. 1–7, together with the latest availability information as of Dec. 31, 1953. Information concerning reports abstracted in *NSA*, Vols. 8, 9, and 10 (1954, 1955, and 1956) appears in issues 24A of those volumes. A completely cumulated listing covering all volumes of *ADD* and *NSA* through Vol. 9 is issued as a separate publication, *Cumulated List of Available Unclassified AEC Reports* (TID-4000 (2nd Edition)). The third Edition of TID-4000 covering reports announced through Vol. 11 is now in press. The Numerical Index of Reports in each issue of *NSA* lists the abstract numbers for the reports abstracted in that issue. The availability information for the reports abstracted in the first half of the year are listed in the semiannual index, issue No. 12B. A complete annual cumulation is published in issue No. 24.

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NUMERICAL INDEX OF REPORTS

PART I

Report	Abstract	Availability
Numerical (Misc.)		
1C-M470	11-8551	See A-3219
1E1-R248	11-2370	See A-1255
2DR-28	11-1788	See A-718
2R-449	11-7716	See A-743
2R-1241	11-9670	See A-1253
4-R-19	11-132	See AECD-3754
4-R-20	11-8555	See A-530
4-R-21	11-7701	See A-531
4-R-95	11-13843	See A-781
56-RL-1647	11-1524	See SO-2525
56-RL-1648	11-1132	See SO-2526
56-RL-1658	11-3426	See SO-2049
57-GL-181	11-10649	See AECU-3513
57-RL-1675	11-5462	Rev. Sci. Instr. 28, 167-75(1957)
57-RL-1693	11-3427	See SO-2050
57-RL-1773	11-10564	See SO-2051
100B-R-82	11-7401	See A-1247
100B-R-131	11-7433	See A-1267
100B-R-152	11-8262	See A-1246
100B-R-183	11-8263	See A-1298
100B-R-188	11-7434	See A-1299
100B-R-200	11-12325	See M-913
100B-R-240	11-8399	See A-2123
100B-R-241	11-7443	See A-2155
100B-R-259	11-7442	See A-2121
100B-R-283	11-7561	See A-2122
100B-R-324	11-11594	See A-2192
100K-R-591	11-2369	See A-1241
100L-39	11-13843	See A-781
100M-79	11-13843	See A-781
100U-L-260	11-13843	See A-781
100XR-1895	11-7702	See A-779
100XR-5610	11-7402	See A-1293
A (Misc.)		
7.390.25	11-14038	Dep.(mc); $0.30(OTS)
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303	11-7739	See CE-277
350	11-8661	See CP-308
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Report	Abstract	Availability
A (Misc.)		
530	11-8555	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
531	11-7701	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
605	11-2368	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
630	11-13024	See CN-633
653	11-11619	See CN-508
673	11-2770	See CF-548
718	11-1788	
743	11-7716	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
779	11-7702	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
781	11-13843	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
854	11-7703	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
867	11-8450	See CT-687
881	11-10891	See CT-685
913	11-11620	See CN-728
931	11-8484	See CT-753
1036	11-7600	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
1038	11-7564	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1046	11-9613	Dep.(mc); $0.25(OTS)
1047	11-13688	Dep.(mc); $0.30(OTS)
1048	11-9614	Dep.; $0.30(OTS)
1049	11-9615	Dep.; $0.25(OTS)
1050	11-9616	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1053	11-7565	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1069	11-13632	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1115	11-7659	See CT-818
1166	11-8481	See CK-895
1241	11-2369	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1246	11-8262	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
1253	11-9670	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
1255	11-2370	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1267	11-7433	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1293	11-7402	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1298	11-8263	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
1299	11-7434	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1304	11-8751	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1323	11-11566	See CC-918
1344	11-7740	See CE-952
1380	11-7605	See CE-973
1426	11-8277	See CK-1040
1490	11-9737	See CT-1104
1630	11-13887	See CE-1143
1652	11-13617	See CC-976
1686	11-7575	See CN-1206
1791	11-8299	Dep.(mc); $6.30(ph OTS)

Report	Abstract	Availability
A (Misc.)		
1806	11-7517	See CN-1227
1987	11-7706	Dep.; $0.25(OTS)
2002	11-13200	See CP-1355
2020	11-2258	See CC-1379
2029	11-7660	See CT-1388
2084	11-13787	See CT-1501
2093	11-10838	See CK-1512
2095	11-7418	See CK-1516
2121	11-7442	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
2123	11-8399	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2155	11-7443	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2191	11-9668	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2192	11-11594	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2277	11-7519	See CN-1412
2283	11-8451	See CT-1440
2352	11-10904	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2354	11-13573	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2355	11-7444	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2356	11-7461	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2357	11-8556	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2358	11-11734	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2359	11-7462	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
2362	11-12354	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
2363	11-13109	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
2364	11-11561	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2365	11-8301	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2367	11-11579	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
2369	11-9708	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2370	11-7463	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
2427	11-13788	See CT-1697
2457	11-11777	See CP-1747
2463	11-10839	See CK-1756
2496	11-7521	See CN-1839
2576	11-13689	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2622	11-8485	See CT-1793
2672	11-13663	See CN-1848
2686	11-8564	See CF-1875
2690	11-13587	See CN-1863
2695	11-7456	See CC-1906
2826	11-7818	See CS-1407
2885	11-13221	See CT-2002
2912(Vol. 2,	11-1772	Dep.(mc); $0.85(OTS)
2912(Vol. 2,	11-5206	Dep.; $0.60(OTS)
2920	11-8403	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3008	11-7815	See CP-2065
3015	11-8269	See CC-1980
3031	11-7457	See CC-1969
3111	11-7403	Dep.; $7.80(ph OTS)
3219	11-8551	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3227	11-11826	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
3344	11-2443	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3602	11-8302	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3626	11-2256	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
3648(Del.)	11-2257	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3719	11-9671	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3751	11-3463	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3789(Sect. 5)	11-7566	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3789(Sec. 7-A)	11-7464	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3789(Sect. 8)	11-8430	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3789(Sect. 13) (Del.)	11-8440	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3814	11-9759	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3971	11-2371	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4035	11-11588	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4046	11-12353	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4048	11-12468	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4049	11-10883	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
AB-R		
46	11-9759	See A-3814
ACCO		
14	11-9672	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
65	11-11595	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
ACRH		
6	11-5132	Dep.; $0.60(OTS)
7	11-13229	Dep.; $2.25(OTS)
AD (Misc.)		
55735	11-548	See AECU-3353
112391	11-3459	See AECU-3376
112420	11-6771	See AECU-3461
AEC-tr		
2337	11-1279	Dep.; JCL
2397	11-1718	Dep.(mc); JCL
2506	11-6634	
2508	11-802	Dep.(mc); JCL
2510	11-4815	
2526	11-1560	Dep.(mc); JCL
2546	11-1502	Dep.(mc); JCL
2550	11-997	Dep.(mc); JCL
2553	11-338	Dep.(mc); JCL
2561	11-794	Dep.(mc); JCL
2578	11-795	Dep.(mc); JCL
2580	11-419	Dep.(mc); JCL
2581	11-420	Dep.(mc); JCL
2611	11-261	Dep.(mc); JCL
2624	11-262	Dep.(mc); JCL
2639	11-803	Dep.(mc); JCL
2640	11-82	Dep.(mc); JCL
2641	11-719	Dep.(mc); JCL
2642	11-83	Dep.(mc); JCL
2643	11-387	Dep.(mc); JCL
2644	11-421	Dep.(mc); JCL
2645	11-279	Dep.(mc); JCL
2646	11-684	Dep.(mc); JCL
2647	11-469	Dep.(mc); JCL
2649	11-84	Dep.(mc); JCL
2650	11-165	Dep.(mc); JCL
2651	11-388	
2653	11-912	Dep.(mc); JCL
2654	11-85	Dep.(mc); JCL

Report AEC-tr	Abstract	Availability
2655	11-339	Dep.(mc); JCL
2656	11-340	
2657	11-86	Dep.(mc); JCL
2658	11-956	Dep.(mc); JCL
2659	11-1236	
2660	11-1024	Dep.(mc); JCL
2661	11-1721	Dep.(mc); JCL
2662	11-1468	Dep.(mc); JCL
2663	11-1759	Dep.(mc); JCL
2664	11-1433	Dep.(mc); JCL
2665	11-1434	Dep.(mc); JCL
2666	11-1492	Dep.(mc); JCL
2667	11-1216	
2668	11-3430	Dep.(mc); JCL
2669	11-1142	
2670	11-1766	Dep.(mc); JCL
2671	11-1516	
2672	11-1435	
2673	11-1011	
2674	11-1416	
2675	11-4827	
2676	11-3785	Dep.(mc); JCL
2677	11-1008	Dep.(mc); JCL
2678	11-837	JCL
2679	11-2797	Dep.(mc); JCL
2680	11-1248	
2681	11-1396	JCL
2682	11-1223	Dep.(mc); JCL
2683	11-2877	
2684	11-1529	
2685	11-1455	JCL
2686	11-1436	JCL
2687	11-1576	
2688	11-1577	
2689	11-1237	JCL
2690	11-1417	
2691	11-1418	
2692	11-1530	
2693	11-1143	
2694	11-1419	Dep.(mc); JCL
2695	11-1420	Dep.(mc); JCL
2697	11-1887	Dep.(mc); JCL
2698	11-1437	
2699	11-2833	Dep.(mc); JCL
2700	11-2816	Dep.(mc); JCL
2701	11-1838	Dep.(mc); JCL
2702	11-3331	Dep.(mc); JCL
2704	11-3914	Dep.(mc); JCL
2705	11-2902	Dep.(mc); JCL
2706	11-7228	Dep.; JCL
2707	11-7213	Dep.; JCL
2708	11-7171	Dep.; JCL
2709	11-7368	Dep.; JCL
2710	11-8047	Dep.; JCL
2711	11-7225	Dep.; JCL
2712	11-7347	Dep.; JCL
2713	11-7375	Dep.; JCL
2714	11-7348	Dep.; JCL
2716	11-7376	Dep.; JCL
2717	11-7294	Dep.; JCL
2719	11-7369	Dep.; JCL
2720	11-7370	Dep.; JCL
2721	11-8026	Dep.; JCL
2722	11-7295	Dep.; JCL
2723	11-8048	Dep.; JCL
2724	11-8233	Dep.; JCL
2725	11-8961	Dep.; JCL
2726	11-8049	Dep.; JCL
2728	11-8050	Dep.; JCL
2729	11-7229	Dep.; JCL
2731	11-8051	Dep.; JCL
2732	11-8052	Dep.; JCL
2734	11-8053	Dep.; JCL
2735	11-7214	Dep.; JCL
2736	11-7371	Dep.; JCL
2737	11-8234	Dep.; JCL
2738	11-8202	Dep.; JCL
2739	11-10603	Dep.; JCL
2740	11-8054	Dep.; JCL
2741	11-8203	Dep.; JCL
2742	11-7377	Dep.; JCL
2743	11-7244	Dep.; JCL
2744	11-7238	Dep.; JCL
2745	11-7349	Dep.; JCL
2746	11-7230	Dep.; JCL
2747	11-8055	Dep.; JCL
2748	11-7350	Dep.; JCL
2749	11-8056	Dep.; JCL
2750	11-7231	Dep.; JCL
2751	11-8057	Dep.; JCL
2752	11-7378	Dep.; JCL
2753	11-7232	Dep.; JCL
2754	11-7379	Dep.; JCL
2755	11-8058	Dep.; JCL
2756	11-8059	Dep.; JCL
2757	11-8192	Dep.; JCL
2758	11-8060	Dep.; JCL
2760	11-10486	Dep.; JCL
2761	11-11294	Dep.; JCL
2762	11-10618	Dep.; JCL
2763	11-10604	Dep.; JCL
2764	11-10612	Dep.; JCL

Report	Abstract	Availability
AEC-tr		
2765	11-10605	Dep.; JCL
2766	11-10606	Dep.; JCL
2767	11-10613	Dep., JCL
2806	11-3332	Dep.(mc); JCL
2807	11-3795	Dep.(mc); JCL
2808	11-3718	Dep.(mc); JCL
2809	11-3343	
2810	11-3762	Consultants Bureau, Inc., New York, N. Y.
2812	11-4290	Dep.(mc); JCL
2813	11-3856	Dep.(mc); JCL
2814	11-3704	Dep.(mc); JCL
2815	11-3739	Dep.(mc); JCL
2816	11-3857	Dep.(mc); JCL
2820	11-4470	Dep.(mc); JCL
2821	11-4603	Dep.(mc); JCL
2823	11-4268	Dep.(mc); JCL
2824	11-4269	JCL
2825	11-4749	Dep.
2826	11-4840	Dep.(mc); JCL
2827	11-5239	
2828	11-5411	JCL
2829	11-4828	Dep.(mc); JCL
2830	11-4754	Dep.(mc); JCL
2831	11-5034	Dep.(mc); JCL
2832	11-4494	Dep.(mc); JCL
2834	11-5191	Dep.(mc); JCL
2837	11-5394	Dep.(mc); JCL
2839	11-4912	
2840	11-4950	Dep.(mc); JCL
2841	11-5933	Dep.(mc); JCL
2842	11-4803	Dep.(mc); JCL
2843	11-4816	Dep.(mc); JCL
2844	11-6193	
2845	11-4806	Dep.(mc); JCL
2846(Pts. 1 & 2)	11-5766	Dep.(mc); JCL
2847	11-5386	
2848	11-5192	Dep.(mc); JCL
2849	11-5395	Dep.(mc); JCL
2850	11-5296	Dep.(mc); JCL
2851	11-5934	Dep.(mc); JCL
2852	11-5767	Dep.(mc); JCL
2853	11-5193	Dep.(mc); JCL
2854	11-6464	Dep.(mc); JCL
2855	11-10642	Dep.; JCL; $0.45(OTS)
2856	11-6190	Dep.(mc); JCL
2857	11-5935	Dep.(mc); JCL
2858	11-5749	Dep.(mc); JCL
2859	11-5768	Dep.(mc); JCL
2860	11-5715	Dep.(mc); JCL
2861	11-6238	Dep.; JCL
2863	11-5194	
2864	11-5304	JCL
2865	11-5819	JCL
2866	11-5195	
2867	11-6223	Dep.
2868	11-6546	Dep.(mc); JCL
2869	11-5928	Dep.(mc); JCL
2870	11-6163	Dep.(mc); JCL
2871	11-6239	Dep.(mc); JCL
2872	11-10393	Dep.; JCL; $0.60(OTS)
2873	11-10488	Dep.; JCL; $2.20(OTS)
2874	11-10399	Dep.; JCL
2875	11-6870	Dep.; JCL
2876	11-11487	Dep.; JCL
2877	11-5799	JCL
2878	11-6430	Dep.(mc); JCL
2879	11-7972	Dep.; JCL
2881	11-6334	JCL
2882	11-6433	JCL
2883	11-6395	
2884	11-6191	JCL
2885	11-6422	JCL
2886	11-6283	JCL
2887	11-6268	JCL
2888	11-6511	
2890	11-6512	
2891	11-6565	JCL
2893	11-6472	
2894	11-6297	
2897	11-6423	
2898	11-6445	Dep.(mc); JCL
2899	11-6750	Dep.(mc); JCL
2900	11-6396	
2902	11-6192	
2903	11-6593	
2904	11-6635	Dep.(mc); JCL
2905	11-6488	Dep.(mc); JCL
2906	11-6636	
2907	11-7181	Dep.(mc); JCL
2908	11-6335	
2909	11-7372	
2910	11-6773	Dep.(mc); JCL
2912	11-6751	Dep.(mc); JCL
2913	11-6752	Dep.(mc); JCL
2914	11-6753	Dep.(mc); JCL
2915	11-6820	Dep.(mc); JCL
2916	11-7215	Dep.(mc); JCL
2917	11-7216	Dep.(mc); JCL
2918	11-7153	
2919	11-7154	
2920	11-7168	JCL
2921	11-7200	Dep.(mc); JCL
2922	11-7041	
2923	11-8012	Dep.(mc); JCL
2925	11-11016	Dep.; JCL; $2.20(OTS)
2926	11-11228	Dep.(mc); JCL

Report	Abstract	Availability
AEC-tr		
2927	11-8948	Dep.(mc); JCL
2928	11-8909	Dep.(mc); JCL
2929	11-8841	Dep.(mc); JCL
2932	11-13413	Dep.(mc); JCL
2933	11-9055	Dep.(mc); JCL
2934	11-9488	Dep.(mc); JCL
2935	11-9443	Dep.(mc); JCL
2936	11-9489	Dep.(mc); JCL
2937	11-8827	Dep.(mc); JCL
2938	11-11921	Dep.(mc); JCL
2939	11-10366	Dep.; JCL
2940	11-10000	Dep.; JCL
2941	11-11437	Dep.; JCL; $0.25(OTS)
2942	11-11061	Dep.(mc); JCL
2943	11-13258	Dep.(mc); JCL
2945	11-11062	Dep.(mc); JCL
2946	11-11063	Dep.(mc); JCL
2947	11-11040	Dep.(mc); JCL
2948	11-10652	Dep.(mc); JCL
2949	11-11229	Dep.(mc); JCL
2950	11-11230	Dep.(mc); JCL
2951	11-11025	JCL
2952	11-11090	JCL
2953	11-11064	Dep.(mc); JCL
2954	11-10570	Dep.(mc); JCL
2955	11-10436	Dep.(mc)
2956	11-11930	Dep.(mc); JCL
2957	11-11922	JCL
2958	11-11047	Dep.(mc); JCL
2959	11-12112	Dep.(mc); JCL
2960	11-11364	Dep.(mc); JCL
2961	11-11026	Dep.(mc); JCL
2962	11-11303	JCL
2963	11-11304	JCL
2964	11-11027	Dep.(mc); JCL
2965	11-11231	JCL
2966	11-11305	JCL
2967	11-11365	Dep.(mc); JCL
2968	11-11232	Dep.; JCL
2969	11-11233	Dep.(mc); JCL
2970	11-11065	Dep.(mc); JCL
2971	11-11234	Dep.(mc); JCL
2972	11-11235	Dep.(mc); JCL
2973	11-11923	Dep.(mc); JCL
2974	11-11313	Dep.(mc); JCL
2975	11-11124	Dep.(mc); JCL
2976	11-11097	JCL
2979	11-11028	Dep.(mc); JCL
2980	11-11236	Dep.(mc); JCL
2981	11-11066	Dep.(mc); JCL
2982	11-11067	Dep.(mc); JCL
2983	11-11924	Dep.; JCL
2984	11-11068	Dep.(mc); JCL
2985	11-11069	Dep.(mc); JCL
2986	11-11331	JCL
2987	11-11261	JCL
2988	11-11347	JCL
2989	11-11262	Dep.(mc); JCL
2990	11-11141	JCL
2991	11-11263	Dep.(mc); JCL
2992	11-11131	JCL
2993	11-11029	JCL
2994	11-11142	JCL
2995	11-11494	JCL
2996	11-11981	JCL
2997	11-11030	Dep.(mc); JCL
2999	11-11931	Dep.(mc); JCL
3000	11-11925	Dep.(mc); JCL
3001	11-12072	Dep.(mc); JCL
3002	11-12770	Dep.; JCL; $0.50(OTS)
3003	11-12771	Dep.; JCL; $0.50(OTS)
3004	11-13327	Dep.(mc); JCL; $0.50(OTS)
3005	11-11832	Dep.; $0.50(OTS)
3006	11-12060	
3007	11-12140	Dep.(mc); JCL
3008	11-11990	Dep.(mc); JCL
3010	11-11926	Dep.(mc); JCL
3012	11-12061	Dep.(mc); JCL
3013	11-11948	Dep.(mc); JCL
3014	11-11182	Dep.(mc); JCL
3015	11-11927	Dep.(mc); JCL
3016	11-11928	Dep.(mc); JCL
3017	11-12094	Dep.(mc); JCL
3018	11-11932	Dep.(mc); JCL
3020	11-12062	Dep.(mc); JCL
3022	11-12113	Dep.(mc); JCL
3033	11-12141	Dep.(mc); JCL
3034	11-11844	JCL
3035	11-13227	Dep.(mc); JCL
3036	11-13348	Dep.(mc); JCL
3037	11-13259	Dep.(mc); JCL
3038	11-12941	Dep.(mc); JCL
3039	11-13300	Dep.(mc); JCL
3040	11-12678	Dep.; JCL
3041	11-13381	Dep.(mc); JCL
3044	11-12778	Dep.(mc); JCL
3047	11-12754	Dep.(mc); JCL
3048	11-12713	Dep.(mc); JCL
3049	11-13386	
AECD		
3669	11-2631	Dep.(mc); $4.80(ph OTS); $2.40(mf OTS)
3689	11-2372	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
AECD		
3690	11-6661	Dep.; $0.30(OTS)
3729	11-1635	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3737	11-2884	Dep.; $0.25(OTS)
3738	11-2854	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3740	11-5079	Dep.; $0.40(OTS)
3741	11-2299	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3742	11-2247	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3743	11-2490	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3751	11-952	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3752 and Suppl.	11-2293	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
3753	11-2238	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3754	11-132	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3755	11-153	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3756	11-154	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3757	11-155	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3758	11-7957	Dep.; $0.40(OTS)
3759	11-1795	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3760	11-2302	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3761	11-2974	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3762	11-3346	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3763	11-6612	Dep.; $0.40(OTS)
3768	11-11967	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3769	11-5562	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3770	11-5563	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3771	11-5564	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3772	11-5565	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3774	11-5566	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3788	11-11193	Dep.; $0.30(OTS)
3855	11-2373	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3866	11-2303	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3996	11-2632	Dep.; $0.25(OTS)
4064	11-2374	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4088	11-2561	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4094	11-2304	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
4129	11-2305	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4145	11-975	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
4148	11-2469	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4164	11-12520	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4172	11-2491	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4173	11-2375	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4182	11-2376	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4211	11-2584	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4213	11-2286	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
4223	11-7302	J. Nuclear Energy 3, 64-9(1956)
4224	11-2377	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4236	11-2378	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4237	11-3413	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4239	11-9253	Dep.; $0.15(OTS)
4240	11-10272	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4241	11-8995	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4243	11-11489	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4244	11-12210	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4245	11-12211	Dep.; $3.30(ph OTS); $2.40(mf OTS)
4246	11-13353	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
AECU		
2203(Rev.)	11-1851	A.I.Ch.E. Journal 2, 536-8(1956)
3030	11-3274	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3080	11-1392	Cancer Research 16, 5-21(1956); Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3114	11-451	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3118	11-592	Dep.; $1.50(OTS)
3128	11-896	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3146	11-976	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3148	11-3438	Dep.; $0.35(OTS)
3150	11-1049	Dep.; $0.25(OTS)
3151	11-1072	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3152	11-830	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
3153	11-2539	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3154	11-1121	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3161	11-5184	Dep.; $0.35(OTS)
3164	11-6323	Trans. Am. Soc. Mech. Eng. 79, 1514-18
3172	11-452	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
3174	11-5873	Dep.; $0.35(OTS)
3176	11-12648	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3178	11-12105	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3181	11-176	Dep.;$0.20(OTS)
3182	11-3464	Dep.; $0.20(OTS)
3183	11-1122	Dep.; $0.40(OTS)
3184	11-5293	Dep.; $0.30(OTS)
3185	11-821	Dep.; $0.30(OTS)
3194	11-1272	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3198	11-1354	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3200	11-3885	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3203	11-2585	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3222	11-2562	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3223	11-2563	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3224	11-2540	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3225	11-2492	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3230	11-2424	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3235	11-2586	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3236	11-2554	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3237	11-2564	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3240	11-2287	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3241	11-2425	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3242	11-2426	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3243	11-2379	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3244	11-2470	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3245	11-2565	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3246	11-2306	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3247	11-2248	Dep.; $0.45(OTS)
3248	11-2566	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3249	11-3946	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3259	11-5427	Dep.; $1.25(OTS)
3260	11-1073	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
AECU		
3261	11-5179	Dep.; $0.55(OTS)
3263	11-1238	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3267	11-1393	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3268	11-1311	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3269	11-1050	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3272	11-5128	Dep.; $0.25(OTS)
3274	11-231	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3279	11-232	Dep.(mc);$1.80(ph OTS); $1.80(mf OTS)
3282	11-233	Dep.(mc);$6.30(ph OTS); $3.00(mf OTS)
3284	11-234	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3292	11-3873	Dep.; $0.25(OTS)
3297	11-3690	Dep.; $0.40(OTS)
3297(Rev.)	11-6613	Dep.; $0.45(OTS)
3299	11-1212	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
3300	11-904	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3301	11-1213	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
3302	11-1214	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3303	11-2587	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3304	11-2596	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3305	11-2588	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3306	11-2414	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3307	11-2415	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3308	11-2249	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3309	11-2567	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3310	11-2568	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3311	11-2569	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3312	11-2589	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3313	11-2555	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3314	11-2590	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3315	11-2444	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3316	11-2570	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3317	11-2571	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3319	11-1655	Dep.; $0.45(OTS)
3326	11-74	Dep.; $0.20(OTS)
3327	11-75	Dep.; $0.20(OTS)
3328	11-628	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3329	11-629	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3331	11-630	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3337	11-481	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3339	11-225	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3341	11-631	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3342	11-632	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3349	11-7320	Dep.; $1.00(OTS)
3350	11-2773	Dep.; $0.35(OTS)
3351	11-18	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3353	11-548	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
3355	11-268	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3356	11-177	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3357	11-178	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3358	11-1312	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3360(Pt. 1)	11-179	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3360(Pt. 2)	11-180	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3360(Pt. 3)	11-5250	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3362	11-4531	Dep.; $1.25(OTS)
3363	11-1013	J. Am. Chem. Soc. 79, 1579-84(1957)
3364	11-411	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3365	11-793	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3366	11-549	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3367	11-1809	Mining Eng. 9, 976-81(1957); Dep.;
3368	11-476	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3369	11-477	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3370	11-5826	Dep.; $0.45(OTS)
3371	11-633	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3372	11-1764	Dep.; $0.25(OTS)
3374	11-1541	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3375	11-1475	Dep.(mc); $0.50(OTS)
3376	11-3459	Phys. Rev. 106, 369-72(1957); Dep.(mc);
3377	11-1542	Dep.(mc); $36.30(ph OTS); $10.20(mf OTS)
3378	11-2777	Dep.; $18.30(ph OTS); $6.00(mf OTS)
3380	11-1543	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3381	11-1709	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3382	11-1873	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3383	11-3325	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3384	11-5910	Dep.; $0.60(OTS)
3385	11-3414	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3386	11-3393	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3387	11-6856	Dep.(mc); $25.80(ph OTS); $7.80(mf OTS)
3388	11-5859	Dep.; $0.25(OTS)
3391	11-4160	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3392	11-4161	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3393	11-3947	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3394	11-3668	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3396	11-4354	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3397	11-5961	Dep.; $0.15(OTS)
3398	11-6068	Dep.; $0.60(OTS)
3398 (Condensed)	11-9131	Nucleonics 15, No. 6, 72-5(1957)
3400	11-3766	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3401	11-3874	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3402	11-3592	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3403	11-3643	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3404	11-4560	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3405	11-3644	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3406	11-4398	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3407	11-4401	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3408	11-4402	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3409	11-4403	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3410	11-4404	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3411	11-4405	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3414	11-4355	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3416	11-4933	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3417	11-5830	Dep.; $0.25(OTS)
3418	11-5133	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3419	11-5364	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
AECU		
3420	11-5532	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3421	11-5436	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3422	11-5402	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3423	11-5365	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3424	11-5874	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3425	11-5957	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3427	11-10714	Dep.; $3.25(OTS)
3427(Add.)	11-11389	Dep.; $0.50(OTS)
3428	11-5798	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3429	11-5185	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3430	11-7135	Dep.; $0.35(OTS)
3431	11-5875	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3432	11-7183	Dep.; $0.25(OTS)
3433	11-5845	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3434	11-5958	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3435	11-6466	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3436	11-6631	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3438	11-6434	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3439	11-6435	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3440	11-6436	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3441	11-6340	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3442	11-6414	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3446	11-11321	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3451	11-6455	Superseded by AECU-3534.
3452	11-6467	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3453	11-6507	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3454	11-6341	Dep.; $0.20(OTS)
3455	11-6779	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3456	11-6733	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3457	11-6437	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3458	11-10631	Dep.; $2.50(OTS)
3459	11-6975	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3460	11-6854	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3461	11-6771	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3462	11-7136	Dep.; $0.45(OTS)
3463	11-7137	Dep.(mc); $0.50(OTS)
3464	11-9172	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3465	11-8069	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3466	11-8070	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3467	11-9980	Dep.; $0.15(OTS)
3471	11-7175	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3473	11-5833	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3474	11-7240	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3475	11-7241	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3476	11-7257	Dep.; $0.40(OTS)
3477	11-12737	Dep.; $3.75(OTS)
3478	11-12212	Dep.; $3.75(OTS)
3479	11-8071	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3480	11-8990	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3482	11-7984	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3483	11-9981	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3485	11-8079	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3486	11-12807	Dep.; $8.25(OTS)
3487	11-10105	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3488	11-8789	Dep.; $0.55(OTS)
3489	11-10106	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3490	11-8072	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3491	11-8972	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3492	11-8941	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3493	11-8073	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3494	11-7918	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3495	11-8074	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3496	11-9186	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3498	11-11283	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3499	11-9464	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3501	11-9276	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
3502	11-9383	Dep.(mc); $3.30(OTS); $2.40(mf OTS)
3503	11-10160	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3504	11-12639	Dep.; $2.50(OTS)
3506	11-10124	Phys. Rev. 107, 1386-95(1957); Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3507	11-10107	Machine Design 124-31(1957); Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3508	11-10161	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3509	11-10273	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3511	11-9982	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3512	11-12916	Dep.; $0.75(OTS)
3513	11-10649	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3516	11-11035	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3518	11-10779	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3519	11-11050	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3521	11-11322	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3522	11-11019	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
3523	11-11159	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3524	11-11242	Dep.(mc); $7.80(ph OTS); $3.30 (mf OTS)
3525	11-11243	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3526	11-11390	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3527	11-12284	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
3528	11-11194	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3529	11-10528	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3530	11-11102	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3532	11-11195	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3533	11-11284	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3534	11-10632	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3535	11-11296	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3536	11-11323	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3537	11-11297	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3538	11-13118	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3539	11-12869	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3540	11-12698	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3541	11-11244	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3542	11-11245	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3543	11-11298	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3544	11-12107	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3545	11-11911	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
AECU		
3546	11-12108	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3548	11-11912	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3549	11-12186	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3554	11-11913	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3555	11-12870	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3556	11-12738	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3557	11-12756	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3558	11-13374	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
3560	11-13332	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3564	11-13377	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AEP		
101	11-13860	Dep.; $0.60(OTS)
AGC (Misc.)		
1225	11-6324	See AGC-AE-32
2914-2	11-3834	See AGC-AE-17
AGC-AE (Misc.)		
16	11-304	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17	11-3834	Dep.; $0.45(OTS)
18	11-8916	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
19(Pt. 1)	11-13574	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22	11-10884	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
23	11-6704	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26	11-10885	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28	11-10886	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29	11-3394	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
32	11-6324	Dep.; $0.50(OTS)
33	11-3835	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
34	11-4448	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
35	11-5330	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AGC-L (Misc.)		
2914-15	11-304	See AGC-AE-16
2914-16	11-8916	See AGC-AE-18
2914-17	11-13574	See AGC-AE-19(Pt. 1)
2914-22	11-3835	See AGC-AE-33
2914-23	11-4448	See AGC-AE-34
2914-24	11-5330	See AGC-AE-35
2917-3	11-6704	See AGC-AE-23
2917-7	11-12012	See IDO-28001
2917-8	11-12891	See IDO-28002
2917-9	11-13308	See IDO-28003
AI		
1612	11-12872	Dep.; $0.75(OTS)
1684	11-6070	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AMES		
1	11-13567	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
AMF-G		
3495	11-13861	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
AMF-GR		
2-54(Del.)	11-13862	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
AMF-GR		
3-54	11-7717	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4-55	11-4663	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
10-55(Del.)	11-11741	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
ANL		
4019	11-7465	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4085	11-7567	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4215(Del.)	11-13575	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4228	11-8322	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4232(Del.)	11-8264	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4238	11-10921	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4258(Del.)	11 11562	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
4265	11-7404	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4274	11-7718	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4284	11-7707	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4288(Rev.)	11-12963	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4304	11-7719	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4316(Del.)	11-13763	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
4326(Del.)	11-13576	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4354(Del.)	11-2632	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4382	11-7466	Dep.; $0.30(OTS)
4442	11-7467	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4450	11-7622	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4469(Del.)	11-13577	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4476	11-11739	Dep.(mc); $8.30(ph OTS); $6.00(mf OTS)
4515	11-9752	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
4530	11-8323	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
4545(Del.)	11-13633	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4552	11-8541	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4554	11-11742	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4564	11-7405	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
4582	11-8461	Dep.; $0.40(OTS)
4590(Del.)	11-12521	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4593	11-9578	Dep.; $0.45(OTS)
4594	11-14024	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4599	11-8305	Dep.; $0.30(OTS)
4604(Rev.)	11-8319	Dep.; $0.25(OTS)
4617	11-9779	Dep.; $0.45(OTS)
4642(Del.)	11-4162	Dep.; $0.25(OTS)
4740(Rev.)	11-8265	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4746	11-11740	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
4757	11-7708	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4797(Del.)	11-8366	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
4798(Del.)	11-8562	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
4800(Del.)	11-13863	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4811	11-9780	Dep.; $0.25(OTS)
4833	11-7455	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
4861(Rev.)	11-8267	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4862	11-9715	Dep.; $0.40(OTS)
4886	11-9774	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4888	11-7406	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
4900	11-13723	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4921	11-9781	Dep.; $0.35(OTS)

Report	Abstract	Availability
ANL		
4939	11-9609	Dep.; $0.25(OTS)
4942(Del.)	11-11563	Dep.(mc); $10.80(ph OTS); $3.90(OTS)
4955	11-7892	Dep.; $0.50(OTS)
4956	11-13058	Dep.(mc); $0.35(OTS)
4966(Del.)	11-11687	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4970	11-9727	Dep.; $0.25(OTS)
4973	11-7602	Dep.; $0.30(OTS)
4974	11-9782	Dep.; $0.25(OTS)
4988(Del.)	11-11589	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4999	11-13623	Dep.; $0.15(OTS)
5000(Del.)	11-9579	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
5003	11-9889	Dep.; $0.40(OTS)
5004	11-10818	Dep.; $0.30(OTS)
5007(Del.)	11-12415	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5009	11-7720	Dep.; $0.45(OTS)
5023	11-11743	Dep.; $0.45(OTS)
5024(Rev.)	11-13578	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
5029	11-7893	Dep.; $0.30(OTS)
5037(Del.)	11-8400	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5039(Del.)	11-13579	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5040	11-9753	Dep.; $0.30(OTS)
5053	11-2221	Dep.; $0.50(OTS)
5055	11-7721	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5070	11-9898	Dep.; $0.25(OTS)
5076	11-7623	Dep.; $0.55(OTS)
5077	11-9762	Dep.; $0.40(OTS)
5078	11-12469	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5079	11-9783	Dep.; $0.30(OTS)
5089	11-9728	Dep.; $0.25(OTS)
5095	11-9784	Dep.; $0.40(OTS)
5102	11-7568	Dep.; $0.50(OTS)
5108	11-7722	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
5109(Del.)	11-8324	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5110(Del.)	11-13764	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5117	11-7624	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5123	11-7723	Dep.; $0.50(OTS)
5124	11-7884	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5132(Del.)	11-10922	Dep.(mc);$10.80(ph OTS); $3.90(mf OTS)
5134	11-13864	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
5147(Rev.)	11-9716	Dep.(mc); $0.45(OTS)
5150	11-9775	Dep.; $0.20(OTS)
5160	11-2769	Dep.; $0.45(OTS)
5175	11-7690	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5180	11-7625	Dep.(mc); $0.50(OTS)
5186(Del.)	11-13865	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
5189	11-9785	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5196	11-9717	Dep.; $0.30(OTS)
5208(Del.)	11-13866	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
5215	11-13580	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
5214	11-7895	Dep.; $0.35(OTS)
5222	11-9786	Dep.; $0.55(OTS)
5234	11-7626	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
5244(Del. 2)	11-13867	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5254(Del.)	11-13581	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
5255	11-10841	Dep.(mc): $0.30(OTS)
5257(Del.)	11-11688	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5260(Del. 2)	11-13868	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
5283	11-9787	Dep.; $0.25(OTS)
5289	11-7399	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
5296	11-7627	Dep.; $0.40(OTS)
5297	11-10923	Dep.(mc); $33.30(ph OTS); $9.60(mf OTS)
5299	11-12470	Dep.(mc); $0.40(OTS)
5305	11-9610	Dep.; $0.30(OTS)
5313	11-11744	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5329	11-6734	Dep.; $0.25(OTS)
5335	11-7866	Dep.; $0.35(OTS)
5339	11-13765	Dep.(mc); $0.30(OTS)
5341	11-13766	Dep.(mc); $0.35(OTS)
5346	11-13199	Dep.(mc); $0.25(OTS)
5347	11-2222	Dep.; $0.40(OTS)
5349	11-13025	Dep.(mc); $0.60(OTS)
5350	11-7896	Dep.; $0.35(OTS)
5366(Del.)	11-8401	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5371	11-11745	Dep.; $1.60(OTS)
5376	11-12458	Dep.(mc); $0.35(OTS)
5377	11-7628	Dep.; $0.40(OTS)
5380	11-10872	Dep.(mc); $0.40(OTS)
5395	11-7882	Dep.; $0.25(OTS)
5411(Del.)	11-11564	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5437	11-1314	Dep.; $1.75(OTS)
5439(Del.)	11-8462	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5457	11-7724	Dep.; $0.70(OTS)
5461	11-13869	Dep.; $0.60(OTS)
5465(Del.)	11-10887	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5466	11-7407	Dep.; $0.60(OTS)
5471	11-11746	Dep.(mc); $1.10(OTS)
5477	11-7883	Dep.; $0.30(OTS)
5489	11-7629	Dep.; $0.50(OTS)
5494(Del.)	11-9580	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
5530	11-9286	Dep.; $0.35(OTS)
5537	11-7884	Dep.; $0.35(OTS)
5539	11-13561	Dep.; $1.25(OTS)
5541	11-7630	Dep.; $0.50(OTS)
5544	11-636	Dep.; $0.30(OTS)
5548	11-1123	Dep.; $0.20(OTS)
5554	11-550	Dep.; $0.70(OTS)
5560	11-7408	Dep.; $0.80(OTS)
5561	11-11747	Dep.; $1.10(OTS)
5563	11-11689	Dep.(mc); $0.50(OTS)
5571	11-11748	Dep.(mc); $1.10(OTS)
5584	11-893	Dep.; $1.00(OTS)
5587	11-2898	Dep.; $0.30(OTS)
5589	11-5573	Dep.; $0.25(OTS)
5590	11-8892	Dep.; $0.35(OTS)
5592	11-6000	Dep.; $1.75(OTS)
5594(Del.)	11-13870	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)

Report	Abstract	Availability
ANL		
5599	11-7725	Dep.; $0.45(OTS)
5601	11-4664	Dep.; $0.50(OTS)
5602	11-13582	Dep.; $0.75(OTS)
5607	11-9090	Dep.; $2.25(GPO)
5609	11-2026	Dep.; $0.60(OTS)
5621	11-4413	Dep.; $0.65(OTS)
5622	11-1579	Dep.; $0.45(OTS)
5624	11-969	Dep.; $0.20(OTS)
5629	11-12873	Dep.; $6.00(OTS)
5630	11-1355	Dep.; $0.35(OTS)
5633	11-9581	Dep.; $0.80(OTS)
5634	11-478	Dep.(mc); $0.35(OTS)
5641	11-1426	Dep.; $0.15(OTS)
5642	11-2975	Rev. Sci. Instr. 28, 233-44(1957); Dep.;
5647	11-4072	Dep.; $0.55(OTS)
5651	11-5004	Dep.; $0.55(OTS)
5652	11-4665	Dep.; $0.15(OTS)
5655	11-4781	Dep.; $0.70(OTS)
5657	11-6521	Dep.; $0.40(OTS)
5658	11-6717	Dep.; $0.25(OTS)
5661	11-9323	Dep.; $0.30(OTS)
5662	11-7184	Dep.; $0.25(OTS)
5664	11-11105	Dep.; $1.25(OTS)
5667	11-6863	Dep.; $0.50(OTS)
5669	11-4846	Dep.; $0.15(OTS)
5672	11-6718	Dep.; $0.20(OTS)
5677	11-10048	Dep.; $0.20(OTS)
5679	11-7291	Dep.; $0.55(OTS)
5684	11-10173	Dep.; $0.25(OTS)
5685	11-6884	Dep.; $0.25(OTS)
5687	11-6071	Dep.; $0.15(OTS)
5688	11-10717	Dep.; $0.50(OTS)
5690	11-8917	Dep.; $0.20(OTS)
5693	11-9245	Dep.; $0.25(OTS)
5696	11-7910	Dep.; $0.60(OTS)
5697	11-6522	Dep.; $0.20(OTS)
5698	11-10231	Dep.; $0.50(OTS)
5700(Pt. A)	11-7155	Dep.; $0.30(OTS)
5700(Pt. B)	11-8246	Dep.; $0.25(OTS)
5704	11-6072	Dep.; $0.50(OTS)
5710	11-9091	Dep.; $0.35(OTS)
5711	11-10718	Dep.; $0.25(OTS)
5713	11-8199	Dep.; $0.35(OTS)
5725	11-9223	Dep.; $0.20(OTS)
5726	11-11392	Dep.; $0.20(OTS)
5729	11-11393	Dep.; $0.20(OTS)
5732	11-12642	Dep.; $5.50(OTS)
5738	11-9441	Dep.; $0.15(OTS)
5739	11-10633	Dep.; $0.40(OTS)
5741	11-10584	Dep.; $0.30(OTS)
5742	11-10719	Dep.; $0.40(OTS)
ANL		
5743	11-10409	Dep.; $0.25(OTS)
5745	11-9399	Dep.; $0.20(OTS)
5753	11-12739	Dep.; $2.00(OTS)
5761	11-12213	Dep.; $4.25(OTS)
5762	11-11446	Dep.; $0.25(OTS)
5765	11-12716	Dep.; $0.75(OTS)
5767	11-11103	Dep.; $0.75(OTS)
5782	11-13488	Dep.; $0.50(OTS)
ANL-FF		
100t(Del.)	11-2493	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
ANL-JJK		
14B-45	11-3772	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
ANL-JMW		
45	11-4073	Dep.; $0.40(OTS)
ANL-JTW		
6	11-7726	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
ANL-LB-SL		
1053	11-9788	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
ANL-RCV-SL		
1090	11-9718	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1094	11-11596	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1120	11-10842	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
ANL-SL-SL		
1039	11-11565	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
ANL-WAR-SL		
1140	11-12357	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
ANL-WHZ		
122	11-8575	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
250(Del.)	11-3544	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
ANP		
58	11-13871	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
71(Del.)	11-8542	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
APAE-Memo (Misc.)		
1	11-13872	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2A	11-6885	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7	11-2097	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
9	11-1976	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16	11-2098	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17	11-13873	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25	11-2099	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
29	11-13874	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
34	11-2195	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50	11-2102	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57	11-13875	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
61	11-13876	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
68	11-13877	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
79	11-13878	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
APAE-Memo (Misc.)		
85	11-6886	Dep.; $1.00(OTS)
86	11-8163	Dep.; $0.25(OTS)
87	11-10275	Dep.; $4.75(OTS)
88	11-10634	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
92	11-7322	Dep.; $0.35(OTS)
96	11-7323	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
98	11-8231	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
99	11-10720	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
107	11-10721	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
APDA		
102	11-7727	Dep.; $0.55(OTS)
105	11-13879	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
108	11-6887	Dep.; $0.55(OTS)
111	11-2103	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
115	11-2104	Dep.; $0.55(OTS)
APEX (Misc.)		
265	11-254	Dep.; $0.35(OTS)
270	11-4074	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
277	11-3062	Dep.; $0.20(OTS)
292	11-5878	Dep.; $0.15(OTS)
299	11-8024	Dep.; $0.40(OTS)
303	11-8164	Dep.; $0.30(OTS)
313	11-10055	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
314	11-10174	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
315	11-10065	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
316	11-10162	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
317	11-10163	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
318	11-10164	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
320	11-13354	Dep.; $0.75(OTS)
321	11-12011	Dep.; $0.20(OTS)
331	11-12874	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
ASAE (Misc.)		
2	11-3475	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4	11-4075	Dep.; $4.80(ph OTS); $2.70(mf OTS)
5	11-6523	Dep.; $0.30(OTS)
ASTRA		
200-E-1.1	11-12241	See NYO-4849
415-E-2.1	11-6886	See APAE-Memo-85
415-E-2-2	11-8163	See APAE-Memo-86
415-E-4-1	11-10275	See APAE-Memo-87
B		
6.460.9	11-2372	See AECD-3689
6.460.10	11-2491	See AECD-4172
6.460.12	11-2584	See AECD-4211
BAW		
1004	11-12214	Dep.; $1.00(OTS)
1009	11-12875	Dep.; $0.30(OTS)
1011	11-12215	Dep.; $0.15(OTS)
1012	11-12216	Dep.; $0.30(OTS)
1017	11-12217	Dep.; $1.80(OTS)
BBC		
1	11-2494	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
7	11-7631	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
12	11-2495	Dep.(mc); $6.30(ph OTS)
24	11-11691	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
30	11-9729	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
37	11-2496	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
47	11-11692	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
48	11-2497	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
50	11-9730	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
BC		
28	11-13690	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
BM		
3507	11-12105	See AECU-3178
BM-II		
16	11-13059	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
24	11-13060	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
37	11-13061	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
38	11-13062	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
39	11-13063	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
42	11-13064	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
48	11-13066	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51	11-13067	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54	11-13068	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
59	11-13069	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
62	11-13070	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
63	11-13071	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
68	11-13072	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
70	11-13073	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
72	11-10888	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
73	11-13074	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
80	11-13767	Dep.; $0.40(OTS)
84	11-13075	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
90	11-13768	Dep.; $0.40(OTS)
92	11-10873	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BMI (Misc.)		
69	11-8463	Dep.; $0.35(OTS)
71	11-9892	Dep.; $0.40(OTS)
76	11-7632	Dep.; $0.45(OTS)
98	11-13603	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
235	11-2307	Dep.; $0.25(OTS)
242	11-7468	Dep.; $0.55(OTS)
243	11-7469	Dep.; $0.40(OTS)
243A	11-13634	Dep.(mc); $1.10(OTS)
246	11-7470	Dep.; $0.55(OTS)
247	11-7471	Dep.; $0.35(OTS)
248	11-7472	Dep.; $0.35(OTS)
249	11-7473	Dep.; $0.30(OTS)
251	11-2380	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
252	11-12358	Dep.(mc); $0.35(OTS)
256	11-7474	Dep.; $0.40(OTS)
259	11-7897	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
BMI (Misc.)		
260	11-7435	Dep.; $0.30(OTS)
262	11-12986	Dep.(mc); $0.60(OTS)
263	11-12964	Dep.(mc); $0.50(OTS)
268(Del.)	11-12459	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
270	11-8404	Dep.: $0.30(OTS)
279	11-977	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
523	11-4450	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
719(Del.)	11-9731	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
720	11-13769	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
721	11-13770	Dep.(mc); $0.35(OTS)
752	11-13771	Dep.(mc); $0.40(OTS)
763	11-13734	Dep.(mc); $0.25(OTS)
765	11-8464	Dep.; $0.35(OTS)
770(Del.)	11-13772	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
800(Del.)	11-11005	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
802	11-13773	Dep.(mc); $0.30(OTS)
805	11-13774	Dep.(mc); $0.25(OTS)
834	11-12630	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
840	11-1017	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
841(Del.)	11-12522	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
868	11-7633	Dep.; $0.25(OTS)
873	11-8576	Dep.; $0.25(OTS)
877	11-9732	Dep.(mc); $0.30(OTS)
881	11-13775	Dep.; $0.25(OTS)
884	11-7634	Dep.; $0.30(OTS)
887	11-13776	Dep.(mc); $0.30(OTS)
893	11-13052	Dep.(mc); $0.30(OTS)
894	11-13076	Dep.(mc); $0.30(OTS)
895	11-8405	Dep.; $0.30(OTS)
913(Del.)	11-13077	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
915	11-11693	Dep.(mc); $0.35(OTS)
916(Del.)	11-13880	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
923	11-12471	Dep.(mc); $0.35(OTS)
924	11-8465	Dep.; $0.30(OTS)
926	11-10843	Dep.; $0.35(OTS)
927	11-7603	Dep.; $0.35(OTS)
929	11-11694	Dep.; $0.25(OTS)
932	11-11651	Dep.; $0.35(OTS)
934	11-8466	Dep.; $0.30(OTS)
942	11-12523	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
946	11-11597	Dep.; $0.35(OTS)
955	11-12359	Dep.(mc); $0.50(OTS)
959	11-8467	Dep.; $0.25(OTS)
961	11-8406	Dep.; $0.35(OTS)
965	11-8468	Dep.; $0.30(OTS)
966	11-11749	Dep.; $0.35(OTS)
967	11-13635	Dep.; $0.40(OTS)
971	11-11674	Dep.; $0.35(OTS)
975	11-8407	Dep.; $0.25(OTS)
983	11-8469	Dep.; $0.30(OTS)
984	11-8470	Dep.; $0.35(OTS)
986	11-12622	Dep.(mc); $0.30(OTS)
988	11-13583	Dep.(mc); $0.30(OTS)
990	11-10099	J. Metals 9, 878-81(1957)
991	11-13777	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
992	11-7635	Dep.; $0.25(OTS)
998	11-8443	Dep.; $0.30(OTS)
999	11-7636	Dep.; $0.25(OTS)
1001	11-7637	Dep.; $0.35(OTS)
1002	11-8471	Dep.; $0.25(OTS)
1009	11-7898	Dep.; $0.35(OTS)
1010	11-8306	Dep.; $0.45(OTS)
1013	11-7569	Dep.; $0.25(OTS)
1018	11-13778	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1022	11-7409	Dep.; $0.25(OTS)
1028	11-7638	Dep.; $0.50(OTS)
1030	11-7639	Dep.; $0.70(OTS)
1031	11-7728	Dep.; $0.40(OTS)
1039	11-11003	Dep.(mc); $0.30(OTS)
1042(Del.)	11-13616	Dep.; $2.00(OTS)
1043(Del.)	11-13779	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
1045	11-13740	Dep.(mc); $10.80(ph OTS); $1.25(mf OTS)
1048	11-7640	Dep.; $0.45(OTS)
1049	11-13780	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1053	11-7641	Dep.; $0.30(OTS)
1061	11-12472	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1065	11-1033	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1066	11-13781	Dep.(mc); $7.80(ph OTS); $3.30(ph OTS)
1068(Del.)	11-11695	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1069	11-811	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1073	11-12316	Dep.(mc); $0.45(OTS)
1074(Del.)	11-9713	Dep.(mc); $1.80(mf OTS); $1.80(ph OTS)
1078	11-13881	Dep.; $0.40(OTS)
1084	11-7642	Dep.; $0.20(OTS)
1087	11-13741	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1088(Del.)	11-12317	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
1090(Del.)	11-13078	Dep.(mc); $1.00(OTS)
1094(Del.)	11-12473	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
1096	11-305	Dep.(mc); $0.35(OTS)
1098	11-5702	Dep.; $0.30(OTS)
1099	11-11750	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1103	11-7570	Dep.; $0.35(OTS)
1117	11-7601	Dep.; $0.35(OTS)
1119	11-7729	Dep.; $0.30(OTS)
1121(Del.)	11-9711	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1123	11-1124	Dep.(mc); $0.35(OTS)
1124	11-812	Dep.(mc); $0.35(OTS)
1134	11-306	Dep.; $0.20(OTS)
1135	11-1710	Dep.; $0.40(OTS)
1136(Del.)	11-13782	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1138	11-905	Dep.; $0.40(OTS)
1139	11-8936	Welding J. (N. Y.) 36, 291s-300s(1957)
1141	11-1501	Dep.; $0.35(OTS)
1143	11-4674	Dep.; $0.20(OTS)
1151	11-2913	Dep.; $0.30(OTS)
1154	11-4875	Dep.; $0.65(OTS)
1156	11-4860	Dep.(mc); $0.40(OTS)
1165	11-5856	Dep.; $0.35(OTS)

Report	Abstract	Availability
BMI (Misc.)		
1167	11-6326	Dep.; $0.25(OTS)
1168	11-6365	Dep.; $0.35(OTS)
1169	11-6366	Dep.; $0.40(OTS)
1170	11-5760	Dep.; $0.25(OTS)
1172	11-5574	Dep.; $0.25(OTS)
1175	11-5825	Dep.; $0.15(OTS)
1183	11-11196	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1186	11-9240	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1188	11-10088	Dep.; $0.20(OTS)
1192	11-10499	Dep.; $0.45(OTS)
1196	11-10722	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1198	11-10723	Dep.; $0.30(OTS)
1210	11-11914	Dep.; $2.00(OTS)
1211	11-12662	Dep.; $1.00(OTS)
BMI-HAP		
101	11-3807	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
102	11-3808	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
BMI-HRN		
3	11-8472	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
6	11-8473	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BMI-HWR-S-C		
11	11-12485	See M-3576
BMI-JDS		
1(202)	11-2305	See AECD-4129
127	11-2308	Dep.; $0.25(OTS)
128	11-2309	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
132	11-2381	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
135	11-11598	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
139	11-2310	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
143	11-2311	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
146	11-2312	Dep.; $0.25(OTS)
148	11-2313	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
151	11-8325	Dep.; $0.50(OTS)
153	11-2314	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
158	11-2315	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
160	11-2316	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
162	11-2317	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
163	11-2318	Dep.; $0.35(OTS)
169(Sect. 1)	11-12360	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
170	11-2319	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
175	11-2320	Dep.; $0.60(OTS)
182	11-2321	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
187	11-2322	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
188	11-8326	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
195	11-2323	Dep.; $0.60(OTS)
204	11-2324	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
207	11-2325	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
209	11-8327	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
210	11-2382	Dep.; $1.75(OTS)
212	11-2326	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
213	11-2327	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
216	11-8329	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
BMI-JDS		
217	11-8330	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
219	11-8328	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
224	11-2364	Dep.; $0.35(OTS)
227	11-7571	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
BMI-T		
1	11-8474	Dep.; $0.35(OTS)
7	11-13783	Dep.(mc); $0.30(OTS)
26	11-9601	Dep.(mc); $0.30(OTS)
40	11-12524	Dep.(mc); $0.30(OTS)
BMI-X		
116(Del.)	11-11751	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
128	11-7643	Dep.; $0.55(OTS)
129	11-13625	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
130(Del.)	11-11818	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
132	11-13079	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
134	11-11673	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BNL		
14	11-2633	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
18	11-2634	Dep.(mc); $0.80(OTS)
18(Suppl.)	11-2635	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
21	11-7730	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
23	11-13882	Dep.; $0.45(OTS)
24(Del.)	11-12525	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
27	11-2294	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
46	11-8577	Dep.; $0.55(OTS)
48	11-7731	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
52	11-7732	Dep.; $0.40(OTS)
54	11-3063	Dep.; $0.50(OTS)
59	11-2407	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
60	11-10924	Dep.; $0.55(OTS)
67	11-7733	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
75	11-13080	Dep.(mc); $0.25(OTS)
77	11-6888	Dep.(mc); $0.20(OTS)
78	11-12987	Dep.(mc); $0.30(OTS)
107	11-3347	
111	11-8578	Dep.; $0.30(OTS)
113	11-13883	Dep.(mc); $0.35(OTS)
125	11-8331	Dep.; $0.25(OTS)
145	11-2761	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
179	11-8444	Dep.; $0.35(OTS)
194	11-12526	Dep.(mc); $0.35(OTS)
201	11-8268	Dep.; $0.25(OTS)
211(Del.)	11-13043	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
223(Rev.)	11-11752	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
225	11-7709	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
236	11-7691	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
249	11-7710	Dep.; $0.40(OTS)
255	11-8579	Dep.; $0.25(OTS)
267	11-13884	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
300	11-10277	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
318	11-10278	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
325(Suppl. 1)	11-8137	Dep.; $1.75(GPO)

Report	Abstract	Availability
BNL		
333	11-13885	Dep.(mc): $0.40(OTS)
348	11-7734	Dep.; $0.50(OTS)
376	11-13119	Dep.(mc); $0.30(OTS)
396	11-5130	Dep.; $1.25(OTS)
406	11-12	Dep.; $0.40(OTS)
408	11-4536	Dep.; $0.25(OTS)
412	11-832	J. Am. Med. Assoc. 164, 1192-7(1957);
414	11-1372	Dep.; $0.20(OTS)
418	11-9983	Dep.; $0.25(OTS)
419	11-4487	Dep.; $0.35(OTS)
421	11-3545	Dep.; $0.20(OTS)
423	11-9789	Dep.; $0.30(OTS)
425	11-3950	Dep.; $0.15(OTS)
426	11-7045	Dep.; $0.75(OTS)
429	11-4934	Dep.; $0.15(OTS)
430	11-9188	Dep.; $0.40(OTS)
433	11-11348	Dep.; $0.65(OTS)
439	11-11838	Dep.; $0.40(OTS)
446	11-12717	Dep.; $1.00(OTS)
447	11-11147	Dep.; $0.15(OTS)
453	11-12718	Dep.; $0.50(OTS)
457	11-11968	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1091(Del.)	11-12453	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1443	11-11821	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1573	11-8569	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1575	11-2636	Dep.; $1.80(ph OTS); $1.80(mf OTS)
1811	11-8320	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1895(Del.)	11-11590	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1896	11-7445	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1901	11-7735	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2097	11-8580	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2221	11-7597	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2222	11-8550	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2340	11-2817	Faraday Society Discussions 20, 142-8(1955)
2418	11-16	Am. J. Physiol. 186, 255-7(1956)
2427	11-2862	Anal. Chem. 29, 34-7(1957)
2436	11-3740	J. Chem. Phys. 26, 18-22(1957)
2439	11-8445	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2478	11-167	J. Am. Chem. Soc. 78, 5196-7(1956)
2514	11-13886	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2525-R	11-3323	Experientia 12, 151(1956)
2538	11-8446	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2543	11-1026	See TID-7517(Pt.1)
2565	11-1377	Science 124, 814-17(1956); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2574	11-3392	Phys. Rev. 102, 674-6(1956)
2583	11-34	Proc. Natl. Acad. Sci. U. S. 42, 752-8(1956)
2620	11-6709	Trans. Am. Soc. Mech. Eng. 79, 899-907
2628	11-1460	Chemistry and Industry, 413-14(1956)
2682	11-1399	Phytophathology 46, 525-6(1956)
2857	11-899	Endocrinology 59, 331-9(1956)
2688	11-868	Radiology 67, 650-64(1956)
2726	11-6307	Appl. Spectroscopy 10, No. 3, 155-7(1956)
2737	11-10122	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2739	11-10925	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2743	11-2637	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2749	11-12144	Chemist Analyst 46, 5-6(1957)
2751	11-2164	Acta Cryst. 9, 895-6(1956)
2754	11-7736	Dep.; $0.30(OTS)
2759	11-1801	J. Am. Chem. Soc. 78, 5756-62(1956)
2773	11-7644	Dep.; $0.25(OTS)
2774	11-7604	Dep.; $0.25(OTS)
2775	11-6827	IRE Trans. Nuclear Sci. NS-4, 1-2(1957)
2777	11-6275	Plant Eng. 10, No. 8, 83-6, 174-5(1956)
2779	11-6538	Mech. Eng. 78, 699-702(1956)
2784	11-7095	J. Chem. Phys. 26, 975-83(1957)
2787	11-9790	Dep.; $0.35(OTS)
2789	11-6033	Physica 22, 994-1008(1956)
2794	11-386	Phys. and Chem. of Solids 1, 23-6(1956)
2796	11-11822	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2797	11-779	Phys. Rev. 103, 1796-1801(1956)
2803	11-2066	J. Nuclear Energy 3, 177-87(1956)
2805	11-369	Int. J. of Phys. and Chem. of Solids 1, 27-34(1956)
2808	11-9183	J. Nuclear Energy 5, No. 1, 16-32(1957)
2811	11-6273	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2812	11-13238	Genetics 42, 239-52(1957)
2820	11-3046	Phys. Rev. 104, 1425-33(1956)
2822	11-6267	Phys. Rev. 104, 328-31(1956)
2827	11-8762	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2829	11-6201	J. Immunol. 77, 437-43(1956)
2832	11-782	Phys. Rev. 104, 154-8(1956)
2839	11-3085	J. Inorg. Nuclear Chem. 3, 253-4(1956)
2840	11-7737	Dep.; $0.30(OTS)
2841	11-778	Phys. Rev. 103, 1776-7(1956)
2849	11-11753	Dep.(mc); $0.30(OTS)
2857	11-529	Phys. Rev. 103, 1901-4(1956)
2860	11-2017	Phys. Rev. 104, 924-8(1956)
2865	11-1261	Phys. Rev. 104, 513-17(1956)
2867	11-1614	Phys. Rev. 104, 784-94(1956)
2874	11-3089	Phys. Rev. 104, 1353-64(1956)
2876	11-7738	Dep.; $0.20(OTS)
2879	11-755	Phys. Rev. 104, 271-2(1956)
2882	11-2176	Phys. Rev. 104, 1099-1101(1956)
2894	11-1464	J. Chem. Phys. 25, 1060-1(1956)
2895	11-8931	J. Inst. Metals 85, 409-12(1957)
2896	11-2933	J. of Metals 9, Sect. 2, 131-6(1957)
2898	11-9918	Arch. Pathol. 63, 557-61(1957)
2900	11-3026	Phys. Rev. 104, 1747-57(1956)
2901	11-2795	Science 125, 23-4(1957)
2906	11-7923	Ann. Rev. Physiol. 19, 299-328(1957)
2908	11-1652	Phys. Rev. 104, 855-6(1956)
2909	11-3179	Phys. Rev. 104, 1633-9(1956)
2910	11-9370	Radiation Research 6, 603-10(1957)
2917	11-6438	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2925	11-3042	Phys. Rev. 104, 1382-6(1956)

Report	Abstract	Availability
BNL		
2944	11-11871	Radiation Research 7, 129-38(1957)
2952	11-1997	Science 124, 1253(1956)
2963	11-8834	J. Inorg. and Nuclear Chem. 4, No. 3 and
2964	11-6610	Radiation Research 6, 501-12(1957)
2965	11-11846	Am. J. Botany 44, 397-403(1957)
3003	11-11101	Advances in Catalysis 9, 398-405(1957)
3012	11-10032	Geochim. et Cosmochim. Acta 12, 170-1 (1957)
3025	11-11845	A.M.A. Arch. Pathol. 63, 540-56(1957)
3034	11-11308	J. Inorg and Nuclear Chem. 4, 237-8(1957)
3050	11-11394	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3059	11-6952	Phys. Rev. 106, 256-60(1957)
3065	11-5603	Chem. Eng. Progr. 53, 86F-92F(1957)
3071	11-10463	J. Am. Chem. Soc. 79, 4008-11(1957)
3078	11-8978	Rev. Sci. Instr. 28, 448-51(1957)
3084	11-7977	J. Am. Chem. Soc. 79, 3717-24(1957); Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3110	11-5575	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3122	11-9414	Phys. Rev. 106, 1027-30(1957)
3136	11-10154	Rev. Sci. Instr. 28, 582-4(1957)
3139	11-10346	Phys. Rev. 106, 1168-74(1957)
3142	11-9422	Phys. Rev. 106, 1107-8(1957)
3145	11-10279	Dep.; $0.25(OTS)
3146	11-9092	Dep.; $0.55(OTS)
3171	11-8127	Phys. Rev. 106, 826-8(1957)
3186	11-8128	Phys. Rev. 106, 828-9(1957)
3200	11-7324	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3201	11-7382	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3219	11-13463	Phys. Rev. 107, 1121-30(1957)
3235	11-11342	Phys. Rev. 107, 600-3(1957)
3236	11-11336	Phys. Rev. 107, 563-9(1957)
3248	11-9093	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3275	11-11469	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3299	11-11132	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3334	11-11969	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3335	11-12663	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3338	11-12218	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3339	11-12219	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3340	11-12220	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3341	11-12194	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3342	11-12876	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3343	11-11395	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3343-A	11-11396	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3344	11-12195	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3345	11-12221	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3346	11-12222	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3347	11-12223	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3348	11-12224	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BP		
13	11-13689	See A-2576
BRB		
1	11-2498	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
BRB		
8	11-7645	Dep.; $0.30(OTS)
10	11-7646	Dep.(mc); $0.30(OTS)
15	11-8475	Dep.; $0.25(OTS)
28	11-2914	Dep., $0.25(OTS)
34	11-6991	Dep.; $0.45(OTS)
35	11-8002	Dep.; $0.35(OTS)
BSC		
2054-11(Rev.)	11-3646	Dep.; $0.30(OTS)
BW		
5315	11-4355	See AECU-3414
5316	11-4354	See AECU-3396
5402	11-2541	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
5409	11-2542	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
5413	11-2499	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
BXR		
168	11-9668	See A-2191
C		
1.365.4	11-2373	See AECD-3855
2.320.5	11-2375	See AECD-4173
2.320.6	11-2377	See AECD-4224
5.381.14	11-2376	See AECD-4182
CAMCO-LA		
1	11-13374	See AECU-3558
CC		
918	11-11566	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
976	11-13617	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1379	11-2258	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1677	11-8737	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1830	11-8307	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1906	11-7456	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1969	11-7457	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1980	11-8269	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2092	11-13691	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2099	11-13626	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2322(Del.)	11-4163	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2752	11-2259	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2758	11-11591	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2954	11-11652	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3146	11-11599	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3402	11-8270	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3576	11-8271	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3643	11-8308	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CCCO		
131	11-12361	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
CE		
277	11-7739	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
345	11-13784	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
952	11-7740	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
973	11-7605	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1143	11-13887	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)

Report	Abstract	Availability
CE		
2544	11-8447	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2554	11-13888	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2818	11-7741	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
CEPS		
1129	11-13128	Dep.(mc); $0.25(OTS)
1134	11-637	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CERD-SIC		
106	11-13889	Dep.(mc); $0.35(OTS)
108	11-4012	Dep.; $0.15(OTS)
CF (Argonne National Lab.)		
548	11-2770	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1875	11-8564	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2926	11-8543	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3290	11-13915	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3599	11-2675	Dep.; $0.15(OTS)
3748	11-2264	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CF (ORNL)		
47-3-8	11-7742	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
48-1-175	11-2246	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48-3-258	11-963	See ORNL-532
48-9-183	11-12628	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
49-1-239	11-7475	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
49-4-141	11-7885	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-4-236	11-7743	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-8-81	11-13212	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
49-8-231	11-12527	Dep.(mc); $0.35(OTS)
49-9-114	11-13890	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
49-10-184	11-7744	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-10-186	11-7745	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-10-209	11-7746	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-11-176	11-638	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-11-208	11-639	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-12-75	11-2762	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50-1-18	11-2638	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-1-30	11-640	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-2-27(Del.)	11-13636	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-2-55	11-12362	Dep.(mc); $0.25(OTS)
50-2-112	11-11600	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50-2-143	11-4078	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50-3-108	11-8748	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-4-1	11-8332	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50-4-2	11-11601	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50-4-124 (Vol. III)	11-8581	Dep.(mc); $33.30(ph OTS); $9.60(mf OTS)
50-5-102	11-8476	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-6-26(Del.)	11-13627	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
50-6-102	11-7747	Dep.; $0.50(OTS)
50-6-185	11-7647	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-7-86	11-7748	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50-7-160	11-7749	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
50-9-38	11-8582	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-9-80	11-2328	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CF (ORNL)		
50-9-93	11-7750	Dep.; $0.60(OTS)
50-9-117	11-12631	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-9-118	11-14033	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-10-133	11-7751	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-10-145	11-8738	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-11-121	11-13684	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-12-23	11-7648	Dep.; $0.25(OTS)
50-12-40	11-7649	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-1-10	11-8333	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-1-20	11-8583	Dep.; $0.35(OTS)
51-1-23	11-3836	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-2-145(Del.)	11-11602	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-3-68	11-641	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-3-78(Del.)	11-11603	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-4-20	11-7606	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-4-57	11-8739	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-4-155	11-12988	Dep.(mc); $0.25(OTS)
51-4-176	11-7476	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-5-98 (Vol. II, Pt. I)	11-1656	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
51-6-15	11-8334	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-6-84	11-13198	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-6-149	11-8335	Dep.; $0.25(OTS)
51-6-157	11-2288	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-7-3	11-7752	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-7-66	11-2231	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-7-103	11-7753	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-7-105	11-7754	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-7-110	11-8272	Dep.; $0.25(OTS)
51-7-132	11-8584	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-7-192(Del.)	11-8336	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-8-45	11-7755	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-8-53	11-2640	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-8-67(Del.)	11-11604	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-8-85(Del.)	11-11605	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-8-102	11-8570	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-8-120	11-7410	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-8-137	11-13891	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
51-8-193(Rev.)	11-12528	Dep.(mc); $0.50(OTS)
51-8-213	11-7756	Dep.; $0.85(OTS)
51-8-230	11-7607	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-8-232	11-7757	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-8-237	11-2329	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-8-287	11-2640	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-8-290	11-7758	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-9-69	11-2458	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-9-115	11-7477	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-9-151	11-2330	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-9-152	11-7608	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-9-155(Del.)	11-13892	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-9-177	11-5253	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-10-31	11-7478	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-10-71	11-7479	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
51-10-87	11-2641	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
51-10-91	11-7572	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-10-94	11-11754	Dep.; $0.30(OTS)
51-10-133	11-7999	Dep.; $0.35(OTS)
51-10-138	11-2408	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-10-165	11-2642	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-10-196	11-7759	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-10-204 (Del.)	11-8337	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
51-10-212	11-2597	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-11-28	11-7760	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-11-56	11-8338	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-11-65(Del.)	11-11606	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-11-66	11-12416	Dep.(mc); $0.20(OTS)
51-11-94	11-8585	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-11-96	11-14034	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-11-161	11-11607	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-12-16	11-7411	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-12-43	11-2331	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51-12-48	11-7650	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-12-50	11-8431	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-12-119	11-8586	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-12-122	11-8587	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-12-158	11-7480	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-12-171	11-8408	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-1-22	11-7590	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-1-23	11-11755	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-1-52	11-13584	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-1-60(Del.)	11-13735	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-1-76(Del.)	11-8588	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
52-1-93	11-2383	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-1-137	11-7761	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-1-144(Del.)	11-13081	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-1-181	11-11675	Dep.; $0.30(OTS)
52-1-189	11-13637	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-1-194	11-8339	Dep.(mc); $0.25(OTS)
52-2-12	11-11823	Dep.(mc); $0.60(OTS)
52-2-50	11-2332	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-113	11-7481	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-2-124	11-2581	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
52-2-131(Del.)	11-11608	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-149	11-8340	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-2-150	11-8341	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-214(Del.)	11-13621	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-215	11-7482	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-3-16	11-2620	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-3-20	11-13709	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-3-36	11-7762	Dep.; $0.40(OTS)
52-3-207	11-13742	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-3-211	11-7763	Dep.; $0.25(OTS)
52-3-215	11-9617	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-3-230	11-13609	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-4-13	11-7483	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-4-64	11-11653	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CF (ORNL)		
52-5-33	11-7609	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-5-40(Del.)	11-11824	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-5-90	11-2459	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-5-95	11-7484	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-5-113	11-7485	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-5-144	11-12989	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-5-202	11-7451	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-5-226	11-13893	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
52-5-229	11-7764	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
52-5-235	11-7765	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
52-6-10	11-7766	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-6-107	11-7452	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-6-139	11-7767	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-6-162	11-7591	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-6-169	11-2333	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-7-162	11-2334	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-8-128	11-7768	Dep.(mc); $0.35(OTS)
52-8-136	11-13638	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
52-8-148 (Chap. 1) (Del.)	11-13129	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
52-8-148(Chap. 4, Pt. 2)	11-14026	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
52-8-148 (Chap. 10)	11-10889	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
52-8-148(Chap. 11(Del.))	11-12474	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
52-8-148(Chap. 22)(Del.)	11-10926	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
52-8-161(Del.)	11-8589	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-9-121	11-11654	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-9-175	11-11756	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-10-26	11-12990	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-10-155	11-7769	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-10-194	11-1770	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
52-10-216	11-8590	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-11-3	11-7486	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-11-57	11-2335	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-11-76	11-7610	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-11-98(Del.)	11-8342	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-11-161	11-7771	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-11-189	11-1035	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-11-228	11-13130	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-12-109	11-7651	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-12-117	11-7772	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-12-155	11-2260	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-12-177	11-7773	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-12-226	11-13131	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-1-28	11-12529	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-1-54	11-8591	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
53-1-90	11-13639	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-1-110	11-8592	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-1-150	11-7774	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-1-199	11-13743	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-1-256	11-13744	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
53-1-294	11-13894	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-1-317	11-13132	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-1-323	11-8593	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-1-324(Del.)	11-11609	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-2-50	11-2748	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-2-71	11-3735	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-2-75	11-7775	Dep.; $0.30(OTS)
53-2-78	11-10971	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-2-115	11-13895	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-2-135	11-8343	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-2-136	11-7776	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-2-164	11-8344	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-2-234	11-11676	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-2-249	11-2556	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
53-3-47	11-3296	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-3-102	11-11610	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-3-157	11-2284	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-3-183	11-13785	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-3-204	11-7777	Dep.; $0.20(OTS)
53-3-208	11-13640	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-3-246	11-7487	Dep.(mc); $4.80(OTS)
53-4-22	11-2285	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-4-57	11-13896	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-4-277	11-7458	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-4-292	11-11757	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-5-20	11-8345	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-5-21	11-13133	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-5-45	11-7778	Dep.; $0.25(OTS)
53-5-69	11-2726	See TID-5065
53-5-78(Del.)	11-8409	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-5-112	11-8594	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-5-190	11-13897	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-5-199	11-8595	Dep.; $0.30(OTS)
53-5-202	11-7779	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-5-208	11-8596	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-6-105	11-7488	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-6-110	11-7489	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-6-138	11-7490	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-6-147	11-7780	Dep.(mc); $4.80(OTS)
53-6-158	11-8597	Dep.; $0.35(OTS)
53-6-158(Del).	11-2643	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-6-166	11-7436	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-6-173	11-9618	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-6-176	11-182	Dep.(mc); $4,80(ph OTS); $2.70(mf OTS)
53-6-203	11-7781	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-7-45(Rev.)	11-11611	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-7-100	11-7611	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-7-130	11-7491	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-7-131	11-13898	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-7-136	11-7782	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-7-167	11-2500	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-7-183	11-8346	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-8-95(Del.)	11-8598	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-8-149	11-7412	Dep.; $0.20(OTS)
53-8-219	11-13641	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-8-225	11-12530	Dep.(mc); $1.00(OTS)
53-9-16	11-13213	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-9-27 (Del. 2)	11-13899	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-9-30	11-8599	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-9-94	11-13900	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-9-111	11-7783	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-9-150	11-7784	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
53-9-179	11-13901	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-9-188	11-7492	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-10-22	11-13902	Dep.; $1.00(OTS)
53-10-23	11-12531	Dep.; $0.75(OTS)
53-10-24(Rev.)	11-11758	Dep.(mc); $1.10(OTS)
53-10-25	11-13903	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
53-10-52	11-2261	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-10-107	11-1315	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-10-141	11-2763	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-10-185	11-9791	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-11-25	11-2644	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-11-65	11-12532	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
53-11-145	11-11759	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
53-11-156	11-7900	Dep.; $0.25(OTS)
53-11-191	11-7493	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-11-210	11-7785	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-12-1	11-13134	Dep.(mc); $0.55(OTS)
53-12-26	11-2737	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-12-119	11-7786	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-12-165	11-11760	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
53-12-187	11-7787	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-1-25	11-2621	Dep.; $0.25(OTS)
54-1-46	11-2559	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-1-81	11-12533	Dep.(mc); $1.60(OTS)
54-1-161	11-7788	Dep.; $0.25(OTS)
54-2-99	11-7494	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-2-101	11-3750	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-2-114	11-12976	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-2-126	11-7789	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-2-130	11-7495	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-2-158	11-8600	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-2-200	11-13904	Dep.(mc); $0.30(OTS)
54-2-208	11-8601	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-3-31	11-8410	Dep.; $0.30(OTS)
54-3-44	11-11761	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-3-77	11-8602	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-3-114	11-7496	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
54-3-142	11-8603	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-3-160	11-11762	Dep.(mc); $0.25(OTS)
54-3-174	11-2645	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-4-62	11-4079	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-4-105	11-8604	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-4-112	11-8605	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-4-131	11-7497	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-4-183	11-7790	Dep.; $0.25(OTS)
54-4-194	11-2646	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54-4-220	11-2647	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-4-224	11-8477	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-4-229	11-8411	Dep.(mc); $0.35(OTS)
54-5-2	11-2648	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-5-26	11-8606	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-5-89	11-3778	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-5-100	11-8608	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-5-165	11-8609	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-5-196	11-13046	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-5-246	11-2649	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-6-7	11-7612	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54-6-16	11-7791	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-27	11-2239	Dep.; $0.30(OTS)
54-6-40	11-11763	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-6-60	11-13026	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-71	11-7792	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-110	11-7793	Dep.; $0.30(OTS)
54-6-112	11-7794	Dep.; $0.20(OTS)
54-6-135	11-5005	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-161	11-7795	Dep.; $0.25(OTS)
54-6-169	11-13642	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-178	11 11612	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-185	11-13643	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-210	11-2427	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-6-222	11-2650	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-7-11	11-13135	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-7-14	11-13214	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-7-26	11-8610	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-7-97	11-7413	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-7-59	11-11052	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-7-115	11-2428	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-7-125	11-8611	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-7-196(Del.)	11-8347	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-7-202	11-8612	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-8-53	11-8613	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-8-53 (Rev. 3)	11-13905	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-8-61	11-8614	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-8-77	11-3751	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-8-101	11-11764	Dep.(mc); $0.25(OTS)
54-8-103	11-2749	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-8-125	11-8348	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54-8-167	11-2651	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-8-214	11-8615	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-8-221	11-12632	Dep.(mc); $0.30(OTS)
54-8-225	11-13710	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-8-235	11-4080	Dep.(mc); $1.35(OTS)
54-8-236(Del.)	11-11765	Dep.; $0.80(OTS)
54-8-238(Del.)	11-12534	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
54-8-239	11-11397	Dep.; $1.25(OTS)
54-8-240	11-13906	Dep.; $1.10(OTS)
54-9-64	11-8616	Dep.; $0.30(OTS)
54-9-89	11-7901	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-9-106	11-8349	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-9-129	11-8617	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-9-133	11-2750	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-9-139	11-2460	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-9-139 (Suppl.)	11-2461	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-9-140	11-8165	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-9-157	11-8350	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-9-171	11-7498	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-9-175	11-7796	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
54-9-178	11-4081	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-9-226	11-7797	Dep.; $0.35(OTS)
54-10-16	11-8618	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-10-63	11-2652	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-10-64	11-2409	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-10-96	11-8619	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-10-152	11-13136	Dep.(mc); $0.35(OTS)
54-11-1	11-13137	Dep.(mc); $0.40(OTS)
54-11-12	11-3933	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-11-46	11-7798	Dep.; $0.30(OTS)
54-11-117	11-7499	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-11-122	11-2429	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-11-129	11-2384	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-11-148(Del.)	11-11613	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-11-162	11-7704	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-11-172	11-8620	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-11-184	11-2462	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54-11-185	11-2336	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
54-11-190	11-8621	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-12-6	11-11655	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-12-34	11-8622	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-12-99	11-7799	Dep.; $0.25(OTS)
54-12-146	11-4082	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-12-151	11-2653	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-12-169	11-7573	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54-12-206	11-642	Dep.(mc); $0.35(OTS)
55-1-22	11-1226	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
55-1-29	11-2654	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-1-45	11-7500	Dep.; $0.35(OTS)
55-1-49	11-2655	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-1-53	11-11696	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-1-77	11-2262	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-1-113	11-11766	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
55-1-153	11-7501	Dep.; $0.30(OTS)
55-1-166	11-4083	Dep.(mc); $0.45(OTS)
55-1-183	11-13907	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-1-193	11-8351	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-1-194(Del.)	11-11567	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
55-2-4	11-4084	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-2-52	11-2463	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-2-75	11-2656	Dep.; $0.30(OTS)
55-2-82	11-8623	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-2-92(Del.)	11-8352	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-2-119	11-3716	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-2-128	11-2657	Dep.; $0.20(OTS)
55-2-172 (Del.)	11-8353	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-2-178	11-13908	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-3-57	11-2658	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-3-60	11-643	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-3-62	11-13610	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-3-69	11-7800	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-3-120	11-7502	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-3-178	11-2659	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-3-190(Del.)	11-13644	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
55-4-19	11-7801	Dep.; $0.35(OTS)
55-4-22	11-2622	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-4-24	11-2660	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-4-25	11-5006	Dep.; $0.25(OTS)
55-4-40	11-8412	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-4-71	11-2743	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-4-72(Del.)	11-9619	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-4-149	11-7503	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-4-159	11-2416	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-4-182	11-2430	Dep.; $0.20(OTS)
55-4-193	11-3752	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-33	11-7598	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-34(Del.)	11-12991	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-44	11-7712	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-5-51	11-2661	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-5-62	11-2431	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-5-69	11-7713	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-5-98	11-8413	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-103(Rev.1)	11-644	Dep.(mc); $0.20(OTS)
55-5-112	11-11767	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
55-5-115	11-7802	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-137	11-7504	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-156	11-12535	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-5-156 (Rev. 1)	11-10927	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-5-156 (Rev. 3)	11-4666	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-5-157	11-2662	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-163	11-645	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-5-189	11-2663	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-5-198	11-7414	Dep.; $0.40(OTS)
55-6-27	11-7437	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CF (ORNL)		
55-6-53	11-8624	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-6-57	11-8625	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-6-69	11-4085	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-6-71	11-7415	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-6-93	11-3753	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-6-157	11-13138	Dep.(mc); $0.35(OTS)
55-6-194	11-1316	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-7-49	11-7505	Dep.; $0.25(OTS)
55-7-53	11-7696	Dep.; $0.35(OTS)
55-7-54	11-7803	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-7-64	11-2105	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-7-69	11-3777	J. Am. Chem. Soc. 79, 267-71(1957)
55-7-76	11-7652	Dep.; $0.25(OTS)
55-7-78	11-7804	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-7-84	11-8626	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-7-95	11-2664	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-7-103	11-11580	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-7-107	11-8354	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-7-115	11-2665	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-7-134	11-2666	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-7-141	11-13909	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-8	11-12977	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-21	11-13611	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-42	11-2667	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-8-54	11-7805	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-76(Del.)	11-13731	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-8-77	11-646	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
55-8-87	11-2668	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-97	11-2410	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-8-101	11-2337	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-8-107	11-2669	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-108	11-7805	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-111	11-4667	Dep.; $1.50(OTS)
55-8-114	11-7653	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-8-130	11-7416	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-8-145	11-6891	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-8-157	11-7417	Dep.; $0.55(OTS)
55-8-169	11-8627	Dep.; $0.50(OTS)
55-8-174	11-4086	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-8-175	11-10928	Dep.(mc); $0.30(OTS)
55-8-180(Del.)	11-8355	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
55-8-188	11-2106	Dep.; $0.70(OTS)
55-8-189	11-647	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
55-8-191	11-11768	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
55-8-193	11-4006	Dep.; $0.25(OTS)
55-8-199	11-1317	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
55-9-1	11-3934	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-4	11-11769	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-8	11-2670	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-10	11-3754	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-12	11-11614	Dep.; $0.40(OTS)
55-9-27	11-8628	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
55-9-31(Del.)	11-13612	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-37	11-2543	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-41	11-2591	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-47	11-2671	Dep.; $4.80(ph OTS); $2.70(mf OTS)
55-9-85	11-978	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-112	11-7807	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-113	11-4087	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-125	11-7808	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-133	11-2107	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-9-152	11-2338	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-9-162	11-7809	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-165	11-237	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-9-173	11-12992	Dep.(mc); $0.40(OTS)
55-10-14	11-2672	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-10-38	11-1773	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-10-39	11-8629	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-10-43	11-2673	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-10-83	11-2417	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-10-94(Del.)	11-11770	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-10-118	11-6892	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-10-132	11-2295	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-10-140	11-5576	Dep.; $0.50(OTS)
55-11-20	11-2263	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55-11-28	11-13613	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-11-94	11-12536	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-11-102	11-12355	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-11-122	11-13184	See ORNL-2021
55-11-180	11-10056	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55-11-182	11-1318	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
55-12-48	11-2674	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-12-113	11-2296	Dep.; $0.20(OTS)
55-12-149	11-8630	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-3	11-8356	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-1-9	11-8736	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-1-10	11-8749	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-1-18	11-13645	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-21	11-1074	Dep.; $0.50(OTS)
56-1-26(Del.)	11-8631	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-1-40	11-8571	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-50	11-12318	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-1-54	11-12460	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-63	11-4562	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-1-73	11-11771	Dep.(mc); $0.25(OTS)
56-1-109	11-10837	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-122	11-4668	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-128	11-12319	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-131	11-8432	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-1-141	11-8563	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-1-142	11-12537	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-1-145	11-13139	Dep.(mc); $0.35(OTS)
56-1-151	11-7506	Dep.; $0.30(OTS)
56-1-155	11-12461	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-159	11-4669	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-175	11-7507	Dep.; $0.45(OTS)
56-1-194	11-10805	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-2-2	11-12462	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-3	11-11677	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-35	11-10929	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-37	11-13745	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-40	11-10874	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-47	11-8632	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-48	11-8315	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-54	11-8273	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-59	11-4670	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-63	11-7810	Dep.; $0.25(OTS)
56-2-69	11-8633	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-72	11-8448	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-81	11-13646	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-2-87	11-7811	Dep.; $0.35(OTS)
56-2-88	11-11678	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-89	11-11679	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-99	11-10930	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-100	11-10875	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-104(Del.)	11-13647	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-105	11-7812	Dep.; $0.25(OTS)
56-2-109	11-11772	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-110	11-11727	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-128	11-6073	Dep.; $0.40(OTS)
56-2-134	11-11680	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-135	11-8274	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-140	11-12463	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-146	11-11681	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-154	11-12993	Dep.(mc); $0.60(OTS)
56-2-156	11-12538	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-2-157	11-8357	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
56-2-158	11-8634	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-159	11-10931	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-161(Del.)	11-12417	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-166	11-8635	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-2-168	11-13841	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-12	11-8636	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-13	11-8637	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-14	11-10932	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-17	11-11773	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
56-3-22	11-11615	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-31	11-8638	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-33	11-13648	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-34	11-8639	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-42 and Add.	11-13910	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-44	11-11555	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-52(Del.)	11-12363	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-61	11-8558	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-93	11-8640	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
56-3-112	11-8727	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-3-129	11-12364	Dep.(mc); $0.35(OTS)
56-3-131	11-7508	Dep.; $0.25(OTS)
56-3-135	11-8641	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-138	11-10933	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-139	11-10934	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-151	11-8275	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-153	11-8437	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-3-154	11-8358	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-159	11-13140	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-162	11-13649	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-167	11-8478	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-3-171	11-6292	Dep.; $0.15(OTS)
56-3-173	11-8642	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-4	11-4671	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
56-4-12	11-10905	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
56-4-20	11-8643	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-27	11-10935	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-28	11-8644	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-29	11-13911	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-31	11-8290	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-41	11-13650	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-43	11-8645	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-55	11-11774	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-65	11-8646	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-66	11-13912	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-73	11-8479	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-79	11-979	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-4-87	11-12539	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-93	11-10906	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-4-98	11-10936	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-100	11-13651	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-101	11-13604	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-101 (Suppl. 1)	11-11616	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-103	11-8647	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-106	11-8648	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-115	11-8649	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-120	11-8276	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
56-4-124	11-12540	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-125	11-8650	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-138	11-11682	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-4-140	11-10937	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-144	11-8651	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-164(Del.)	11-13652	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-167	11-8652	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-170	11-11775	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-171	11-11581	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-184	11-11617	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-185	11-8554	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-186	11-8653	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-189	11-8559	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-190	11-8654	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-194	11-10938	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-4-202	11-8560	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-4-214	11-8655	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-17	11-11582	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-24	11-12320	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-40	11-8656	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-5-41	11-8318	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-48	11-7508	Dep.; $0.35(OTS)
56-5-55	11-8657	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-56	11-13628	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-5-58	11-10939	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-5-66	11-12978	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-67	11-13614	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-68(Del.)	11-13615	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-69	11-8658	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-70	11-8659	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-76	11-484	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-89	11-8660	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-100 (Del.)	11-8359	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-5-101	11-10820	Dep.; $0.25(OTS)
56-5-114	11-13692	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-124	11-9792	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-126	11-12541	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-131	11-13622	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-139	11-9766	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-5-141	11-12475	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-143	11-9793	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-165	11-10940	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-5-167	11-10941	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-169	11-10942	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-188	11-10943	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-190	11-9794	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-5-193(Del.)	11-13585	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-5-197	11-12321	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
56-6-27	11-7510	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-28	11-9795	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-29	11-9796	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-32	11-4164	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-41	11-9776	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-56	11-12542	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-63	11-8480	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-73(Del.)	11-13653	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-80	11-9797	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-87	11-9733	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-100	11-7511	Dep.; $0.30(OTS)
56-6-107	11-7813	Dep.; $0.55(OTS)
56-6-120	11-12464	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-123	11-9798	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-125	11-7574	Dep.; $0.25(OTS)
56-6-126	11-9734	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-127	11-12623	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-137	11-9799	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
56-6-138	11-9673	Dep.; $0.30(OTS)
56-6-142	11-10944	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-154	11-13654	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-155	11-12418	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-158	11-12419	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-159	11-13655	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-168	11-12543	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-171	11-9800	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-173	11-12544	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-6-174	11-13656	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-6-175	11-6074	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-12	11-12545	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-7-13	11-9754	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-38	11-9801	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-49	11-12546	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-7-51	11-1862	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
56-7-52	11-12465	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
56-7-56	11-9719	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
56-7-58	11-9802	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-59	11-9703	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-61	11-12503	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-62	11-9803	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-63	11-9804	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-70	11-9770	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-71	11-9805	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-87	11-9806	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-95	11-4361	Dep.; $0.20(OTS)
56-7-97	11-4672	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-7-100	11-7512	Dep.; $0.30(OTS)
56-7-101	11-7513	Dep.; $0.30(OTS)
56-7-106	11-9592	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-107	11-9807	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-116	11-9808	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-117	11-12547	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-118	11-12343	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-7-126	11-5007	Dep.; $0.30(OTS)
56-7-128	11-9760	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-149	11-12548	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-7-157	11-9575	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-11	11-5008	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-19	11-9761	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-20	11-13657	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-28	11-13913	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-8-30	11-980	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-8-34	11-13658	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-49	11-9809	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-8-86	11-11557	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-100	11-7514	Dep.; $0.30(OTS)
56-8-101(Del.)	11-11618	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-102	11-9701	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-120	11-9709	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-122	11-9593	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-124	11-9810	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-8-125	11-9735	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-126	11-5647	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-128	11-13914	Dep.; $0.30(OTS)
56-8-132	11-1476	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-133	11-9606	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-134	11-9811	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-8-135	11-4451	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-8-149	11-9710	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-152	11-9812	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-8-156	11-4673	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-167	11-12365	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-168	11-9895	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-169	11-11776	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-8-175	11-9813	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-176	11-10821	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-187	11-10945	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-189	11-9814	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-198	11-10819	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-199	11-10946	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-200	11-12366	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-201	11-813	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-8-204(Del.)	11-10724	Dep.; $5.50(OTS)
56-8-207(Del.)	11-6075	Dep.; $0.75(OTS)
56-8-208(Del.)	11-7325	Dep.; $1.25(OTS)
56-8-214	11-308	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-8-216	11-238	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-8-219	11-11000	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-2	11-9815	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-6	11-9879	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-24	11-9816	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-25	11-3359	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-27	11-4674	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-30	11-9767	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-34	11-9702	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-35	11-9817	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-41(Del.)	11-13659	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-59	11-9720	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-60	11-6327	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-83	11-9620	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-84	11-12994	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-97	11-10919	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-100	11-12995	Dep.(mc); $0.25(OTS)
56-9-111	11-10947	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-113(Del.)	11-13660	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-119	11-12996	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-9-121(Del.)	11-11697	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-9-126	11-9896	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-9-127	11-12965	Dep.(mc); $0.55(OTS)
56-9-131	11-9704	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-6	11-11683	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
56-10-8	11-9582	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-12	11-10815	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
56-10-13	11-3809	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-10-14	11-12027	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
56-10-15	11-10867	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-16	11-10860	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-10-18(Del.)	11-13786	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-23	11-9705	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-27	11-9707	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-10-35	11-1036	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-10-36	11-309	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-10-37	11-9721	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-41	11-12367	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-43	11-9818	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-10-50	11-9819	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-10-53	11-9820	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-10-58(Del.)	11-13661	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-76	11-310	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-10-77	11-10948	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
56-10-82	11-1509	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-86	11-9224	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-88	11-13568	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-10-104	11-10949	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-114	11-2894	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-10-126(Del.)	11-12966	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-129	11-9821	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-136	11-10903	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-10-139	11-10108	Dep.; $6.50(OTS)
56-11-1	11-4739	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-11-2	11-9755	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-11-5	11-4568	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-11	11-9736	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-24	11-9621	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-25	11-9822	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-27	11-12368	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-29	11-12356	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-35	11-10866	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-36	11-4675	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-52	11-12549	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-57	11-10950	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-58	11-10951	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-59	11-10890	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-72	11-8449	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
56-11-80	11-13662	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-88	11-9824	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-11-90	11-2108	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-105	11-10952	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-112	11-9825	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-113	11-3064	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-115	11-1874	Dep., $3.30(ph OTS); $2.40(mf OTS)
56-11-118	11-1863	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-11-126	11-9826	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-130	11-1513	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-131	11-9827	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-11-132	11-2109	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-11-135	11-2878	Dep.; $9.30(ph OTS); $3.60(mf OTS)
56-11-136	11-1846	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-137	11-1847	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-11-138	11-9722	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-11-142	11-2888	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-11-143	11-11053	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
56-12-4	11-3509	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-12-36	11-2110	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-12-38	11-2111	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-12-41	11-9828	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-48	11-2112	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-49	11-2113	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-61	11-3065	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-12-65	11-3066	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-12-81	11-3067	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-82	11-3546	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
56-12-106	11-13586	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-12-109	11-3068	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-110	11-3069	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-111	11-5212	Anal. Chem. 29, 1627-31(1957); Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-115	11-3547	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-116	11-3070	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-116(Rev.)	11-11470	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-117	11-3071	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-12-118	11-13825	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
56-12-124	11-4414	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
56-12-128	11-7139	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
57-1-3	11-14040	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-5	11-2855	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-13	11-3465	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-32	11-12550	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-1-46	11-3618	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-49	11-3466	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-50	11-4088	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-51	11-3395	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-65	11-5009	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-87	11-9468	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-88	11-3786	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-89	11-4537	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-90	11-4089	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-93	11-4526	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-100	11-4848	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-103	11-4676	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-106	11-4538	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CF (ORNL)		
57-1-107	11-4179	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-109	11-4876	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-116	11-4426	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-117	11-4265	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-118	11-4392	Nuclear Sci. and Eng. 2, 768-77(1957); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-119	11-4740	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-120	11-4677	Nuclear Sci. and Eng 2, 664-75(1957); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-139	11-10509	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-143	11-4678	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-1-144	11-6348	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57-1-150	11-4679	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-159	11-4680	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-1-163	11-5010	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-1-167	11-4973	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-1-172	11-12006	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-2-2	11-7925	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-2-3	11-6595	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
57-2-4	11-7944	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
57-2-5	11-5011	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-2-9	11-5012	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-2-34	11-5013	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-2-36	11-5014	Dep.; $6.30(ph OTS); $3.00(mf OTS)
57-2-37	11-4841	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-2-51	11-4877	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-2-97	11-4925	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
57-2-98	11-5015	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-2-112	11-5332	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-2-120	11-5577	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-2-144	11-4917	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-3-43	11-5254	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-3-44	11-5294	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-3-48	11-6132	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-3-50	11-5367	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-3-60	11-6367	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-3-112	11-6349	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-3-114(Rev.) (Suppl. 1)	11-12007	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57-3-114(Rev.)	11-9283	Dep.(mc); $36.30(ph OTS); $10.20(mf OTS)
57-3-120	11-6076	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-3-128	11-6489	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-3-153	11-7140	Dep.; $0.15(OTS)
57-4-9	11-5245	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-4-17	11-5831	Dep.(mc); $1.80(mf OTS); $1.80(mf OTS)
57-4-20	11-6526	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-4-44	11-10529	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-4-55	11-8911	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57-4-56	11-6457	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-4-64	11-8166	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-4-77	11-6747	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-4-80	11-6958	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-4-87	11-9469	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
57-4-92	11-10280	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-4-96	11-6798	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-4-97	11-6782	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-4-128	11-9094	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-4-137	11-8167	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-5-45	11-8900	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-5-71	11-9287	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57-5-96	11-9470	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-5-98	11-9288	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-5-100	11-9095	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-5-107	11-7990	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-5-110	11-10530	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57-6-4	11-9385	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-6-5	11-9096	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-6-7	11-10513	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-6-17	11-9097	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-6-20	11-8168	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-6-25	11-9471	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-6-26	11-9098	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-6-36	11-9099	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-6-49	11-9289	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-6-51	11-9472	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-6-60	11-10531	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57-6-66	11-10725	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-6-67	11-10532	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-6-87	11-11970	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-6-89	11-11081	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-6-100	11-12877	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-6-105	11-10533	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-6-111	11-9277	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-6-119	11-11129	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-7-21	11-12878	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-7-23	11-11315	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-7-25	11-11398	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-7-31	11-10410	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-7-32	11-11054	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-7-58	11-10552	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-7-68	11-12225	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-7-83	11-11399	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-7-100	11-11106	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-7-108	11-12879	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-7-113	11-11120	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-7-123	11-12794	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57-8-53	11-11400	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-8-67	11-11401	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-8-78	11-12226	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-8-83	11-12227	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-8-84	11-11402	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-8-119	11-12741	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
57-9-36	11-12880	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
57-9-50	11-12699	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
57-9-51	11-12881	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CH		
3589	11-2244	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CHEM-S		
23	11-2402	See RL-4.6.23
49	11-2281	See RL-4.6.49
315	11-2358	See RL-4.6.315
CK		
895	11-8481	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1040	11-8277	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1512	11-10838	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1516	11-7418	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1756	11-10839	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
CL-P		
368	11-7515	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
374	11-8360	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CL-RWS		
31	11-7814	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CLM-JRM		
2	11-12551	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CM		
14-D-1	11-9981	See AECU-3483
CMC-U		
55-3	11-7984	See AECU-3482
CN		
508	11-11619	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
633	11-13024	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
728	11-11620	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
1071	11-7516	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1206	11-7575	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1227	11-7517	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1409	11-7518	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1412	11-7519	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1641	11-7520	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1839	11-7521	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1848	11-13663	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1863	11-13587	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1884	11-8361	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2037	11-7419	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
2196	11-11733	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2215	11-13685	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2224	11-7420	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2279	11-8362	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2511	11-7522	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2558	11-7460	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2564	11-8363	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
2657	11-12369	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2726	11-2366	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3823	11-12370	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3823(Del.)	11-10840	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
3274	11-9622	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
COO		
106	11-2501	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
107	11-2502	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
110	11-2503	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
111	11-2504	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
136	11-156	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
138	11-157	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
139	11-158	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
178	11-10329	Dep.; $0.40(OTS)
180	11-2505	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
201	11-159	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
208(Del.)	11-13916	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
310	11-3837	Dep.; $0.20(OTS)
312	11-1875	Dep.; $0.70(OTS)
1016	11-5378	Dep.; $0.60(OTS)
CP		
308	11-8661	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1355	11-13200	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1747	11-11777	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2048	11-2676	Dep.; $0.25(OTS)
2065	11-7815	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2242	11-7446	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2273	11-2677	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2314(Rev.)	11-13082	Dep.(mc); $0.35(OTS)
2342	11-13983	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
2774	11-8662	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2882	11-7816	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2890	11-8309	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3445	11-11698	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3493	11-8663	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CPP		
54-64(Del.)	11-457	See IDO-14382(Del.)
CRD-A		
27-43	11-7839	See LWS-22534
CRD-R		
1	11-7840	See LWS-24612
2	11-8482	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17	11-8682	See LWS-24701
21(Del. 2)	11-13917	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
23	11-12629	See LWS-24734
28	11-2707	See LWS-24733
30	11-13107	See LWS-24712
33	11-7817	Dep.; $0.30(OTS)
35	11-8566	See LWS-24730
51	11-2708	See LWS-24806
92	11-12483	See LWS-24923
107	11-11819	See LWS-30103
CRD-T		
1-78	11-7878	See LWS-24318
1-116	11-8732	See LWS-24418
1-154	11-8439	See LWS-24525

Report	Abstract	Availability
CRD-T		
1-184	11-13044	See LWS-24632
2A-41	11-13826	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2B-45	11-7867	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2B-49	11-8433	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2B-83	11-9882	See LWS-24610
2B-98	11-13194	See LWS-24589
2B-128	11-11617	See LWS-24477
2C-63	11-13746	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2C-106	11-13201	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2C-108	11-13202	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4A-64	11-10995	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4A-75	11-13827	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4A-85	11-8728	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4A-93(Del.)	11-9881	See LWS-24317(Del.)
4A-126	11-13828	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4A-140	11-13829	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4C-111	11-8317	See LWS-24620
CS		
1407	11-7818	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
CT		
393	11-11656	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
422	11-7654	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
423	11-7655	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
468	11-7656	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
541	11-7657	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
585	11-10891	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
687	11-8450	Dep.(mc); $7.80(ph OTS); $3.40(mf OTS)
688	11-7658	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
753	11-8484	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
818	11-7659	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1104	11-9737	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1182	11-7613	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1388	11-7660	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1440	11-8451	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1501	11-13787	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1697	11-13788	Dep.(mc); $0.40(OTS)
1793	11-8485	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1914	11-13736	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2002	11-13221	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2144	11-11657	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2253	11-13789	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2433	11-10870	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2443	11-8486	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2483	11-13790	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2607	11-8487	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2633	11-7697	Dep.; $0.45(OTS)
2634	11-7661	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2700	11-7662	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2733	11-7576	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2743	11-7663	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
2783	11-8752	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
CT		
2787	11-7664	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2794	11-7665	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
2925	11-7666	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
2950	11-7667	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2951	11-8488	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2958	11-8489	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2961	11-8490	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2983	11-8491	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3030	11-13747	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3035	11-8452	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3045	11-7421	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3052	11-10876	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3054	11-8492	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3229	11-11690	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3309	11-7668	Dep.; $0.40(OTS)
3310	11-8493	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3373(Del.)	11-10869	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3491	11-8442	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3511	11-8494	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3714	11-9738	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3804	11-8495	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
CU (Misc.)		
1-56-AEC-1817-Met	11-1181	See NYO-7397
11-53-At-dP-Ch. E.(Rev.)	11-12443	Dep.(mc); $0.30(OTS)
77-55-AT (30-1)-755-Chem.	11-1229	See NYO-6242
101-56-ONR-110-1-Phys	11-5494	See NEVIS-19
146	11-551	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
147	11-1273	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
148	11-768	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
149	11-1274	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
150	11-1219	Rev. Sci. Instr. 28, 1-3(1957) Jan. Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
152	11-8996	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
153	11-7292	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
154	11-10232	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
155	11-3951	Dep.; $12.30(ph OTS); $4.50(mf OTS)
156	11-4971	Phys. Rev. 105, 1413-15(1957)
157	11-10686	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
158	11-10687	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
160	11-9068	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
165	11-10770	Dep.(mc); $8.30(ph OTS); $6.30(mf OTS)
CWC-ED		
5	11-6661	See AECD-3690
CWR		
456	11-12726	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
464(Del.)	11-13490	Dep.; $1.75(OTS)
D		
20	11-11588	See A-4035

Report	Abstract	Availability
DC		
51-6-9	11-8740	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-7-10	11-8741	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-8-7	11-8664	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-11-18	11-13203	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-12-24	11-13204	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-2-32	11-4074	See APEX-270
56-3-97	11-10055	See APEX-313
DCF		
4709	11-9748	See SEP-140
5002(Del.)	11-12448	See SEP-170(Del.)
DF		
52GL174	11-2299	See AECD-3741
DOW		
66	11-1018	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
91	11-4842	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
112-A	11-3755	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
140	11-981	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
146	11-183	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
149	11-982	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
150	11-1427	Anal. Chem. 30, 50-4(1958); Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
152	11-2856	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
154	11-5256	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
156	11-8864	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
157	11-7142	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
161	11-13290	Dep.; $1.50(OTS)
DOW-NR		
55001-1-S	11-8665	Dep.; $0.40(OTS)
DP		
25	11-8364	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
32	11-9829	Dep.; $0.35(OTS)
34	11-2598	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
48	11-648	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
60	11-7698	Dep.; $0.35(OTS)
68	11-7699	Dep.; $0.30(OTS)
114	11-7819	Dep.; $0.40(OTS)
117	11-13049	Dep.(mc); $0.25(OTS)
120	11-9372	Dep.; $0.50(OTS)
133(Del.)	11-9830	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
136	11-13605	Dep.(mc); $0.30(OTS)
137	11-983	Dep.; $4.80(ph OTS); $2.70(mf OTS)
139	11-4212	Dep.; $0.25(OTS)
141	11-984	Dep.; $4.80(ph OTS); $2.70(mf OTS)
142	11-1239	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
143	11-1321	Dep.; $6.30(ph OTS); $3.00(mf OTS)
145	11-1240	Dep.; $3.30(ph OTS); $2.40(mf OTS)
147(Del.)	11-13918	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
169	11-3838	Dep.; $0.25(OTS)
170	11-2900	Dep.; $0.20(OTS)
171	11-923	Dep.; $0.15(OTS)
172	11-1977	Dep.; $0.25(OTS)

Report	Abstract	Availability
DP		
173	11-769	Dep.; $0.15(OTS)
176	11-3476	Dep.; $0.15(OTS)
177	11-3477	Dep.; $0.15(OTS)
178	11-5947	Dep.; $0.20(OTS)
179	11-13050	Dep.(mc); $0.25(OTS)
181	11-7143	Dep.; $0.25(OTS)
186	11-4326	Dep.; $0.20(OTS)
188	11-5714	Dep.; $0.20(OTS)
189	11-4406	Dep.; $0.15(OTS)
190	11-8082	Dep.; $0.15(OTS)
194	11-6508	Dep.; $0.30(OTS)
197	11-5963	Dep.; $0.15(OTS)
200	11-12883	Dep.; $3.50(OTS)
202	11-8839	Dep.; $0.15(OTS)
203	11-12795	Dep.; $0.50(OTS)
207	11-8139	Dep.; $0.15(OTS)
208	11-10727	Dep.; $0.20(OTS)
212	11-12802	Dep.; $0.50(OTS)
214	11-10534	Dep.; $0.20(OTS)
215	11-10614	Dep.; $0.15(OTS)
216	11-10615	Dep.; $0.15(OTS)
218	11-12673	Dep.; $0.75(OTS)
222	11-12884	Dep.; $1.25(OTS)
232	11-11407	Dep.; $0.25(OTS)
DPSP		
53-167	11-12592	See TID-5367
54-25-18	11-11805	See TID-5371
DPSPU		
56-11-30	11-6435	See AECU-3439
DPST		
54-309	11-13589	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
DPXN		
208	11-8709	See TID-5392
213	11-12593	See TID-5397
EAH		
81	11-2293	See AECD-3752 and Suppl.
ER (Misc.)		
6351	11-5873	See AECU-3174
ERI		
1943-7-23-P	11-5293	See AECU-3184
2240-2-F	11-5184	See AECU-3161
ESP		
52-351	11-12466	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
F		
2437	11-1049	See AECU-3150
F-TS		
8465/V	11-1718	See AEC-tr-2397
8776/V	11-6593	See AEC-tr-2903

Report	Abstract	Availability
F-TS		
8777/V	11-7041	See AEC-tr-2922
FMPC		
66	11-9594	Dep.; $0.25(OTS)
122	11-7577	Dep.; $0.30(OTS)
131	11-13589	Dep.(mc); $7.80(ph OTS); $3.30(ph OTS)
149(Rev.)	11-7669	Dep.; $0.30(OTS)
160	11-8496	Dep.; $0.30(OTS)
165(Rev. 1)	11-7422	Dep.; $0.25(OTS)
173	11-7423	Dep.; $0.35(OTS)
175	11-9726	Dep.; $0.30(OTS)
176	11-7578	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
192	11-13053	Dep.(mc); $0.25(OTS)
193	11-8497	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
207	11-7424	Dep.; $0.35(OTS)
296	11-9712	Dep.; $0.25(OTS)
332	11-7670	Dep.; $0.35(OTS)
339	11-13693	Dep.(mc); $0.30(OTS)
427	11-9623	Dep.; $0.30(OTS)
435	11-12997	Dep.(mc); $0.25(OTS)
467	11-10844	Dep.(mc); $0.25(OTS)
488	11-10892	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
489	11-8498	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
497	11-8414	Dep.; $0.30(OTS)
516(Del.)	11-13791	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
FR		
1003-B	11-13118	See AECU-3538
G (Misc.)		
3608	11-4663	See AMF-GR-4-55
4229(Del.)	11-11741	See AMF-GR-10-55(Del.)
GAT		
184(Rev. 1)	11-6222	Dep.; $0.20(OTS)
189	11-1322	Dep.; $0.25(OTS)
GAT-DM		
455	11-6458	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GAT-DR		
226	11-8865	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
GAT-L		
188	11-3915	Appl. Spectroscopy 10, 203-6(1956)
366	11-9267	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GE-IY		
6	11-13203	See DC-51-11-18
7	11-13204	See DC-51-12-24
GEAP		
0554	11-651	See IDO-24020
GEI		
28557	11-2293	See AECD-3752 and Suppl.
GEN		
3	11-7970	See RMO-2652
GS-B		
1019-F	11-11188	Dep.(mc); $0.40(GPO)
1029-A	11-7109	Dep.(mc); $0.25(GPO)
1059-A	11-11189	Dep.(mc); $0.25(GPO)
1059-B	11-11190	Dep.(mc); $0.20(GPO)
H		
1.740.8 (Paper 4 (Rev.))	11-2374	See AECD-4064
6.350.25	11-13027	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HCC		
1	11-9674	Dep.; $0.50(OTS)
HDC		
1630	11-2561	See AECD-4088
1840	11-8365	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1876	11-6674	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2095	11-13215	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HEC		
74	11-5189	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
77	11-9984	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
78	11-6368	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HKF		
3	11-2678	Dep.; $1.50(OTS)
8(Pts. I-III)	11-2711	See M-4412(Pts. I-III)
1492D-41(Del.)	11-11778	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HW		
8767	11-7447	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
8879	11-8499	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
10620	11-8366	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
11885	11-12998	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
12183	11-11621	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
12780(Rev.)	11-953	Dep.(mc); $0.35(OTS)
12964	11-8453	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
13280	11-8291	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
13282	11-7459	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
13481	11-8367	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
13908(Del.)	11-12999	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
13959	11-11779	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
14603	11-8292	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14923	11-7523	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14955	11-13748	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
15233	11-2339	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
15279	11-7820	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
15743	11-2240	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
15776	11-2265	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
15944	11-7438	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16076	11-8368	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
17010	11-7614	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17136	11-7425	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17097	11-2266	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
HW		
17159	11-8454	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17226	11-7524	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17265	11-7562	Dep.; $1.80(ph OTS); $1.80(mf OTS)
17519	11-13664	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17543	11-7439	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17626	11-7615	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17698	11-7525	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17822	11-2340	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17937	11-8369	Dep.; $0.25(OTS)
17981	11-7526	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
18128	11-13590	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
18149	11-7527	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18150	11-8293	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
18188	11-7563	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18404(Rev.)	11-13665	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18492	11-7580	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18497	11-8415	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
19023	11-8370	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
19065	11-8371	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19096	11-8278	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19105	11-7528	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19112	11-8372	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
19300	11-11583	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19303	11-12371	Dep.(mc); $0.30(OTS)
19933	11-7592	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
20008	11-4423	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
20055(Del.)	11-8260	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
20268	11-10806	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
20276	11-2506	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
20287	11-8373	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
20305	11-2341	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
20598	11-7581	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
20605	11-8500	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
20936	11-7426	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
21160	11-8455	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
21415 and Suppl.	11-2471	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
21442	11-11622	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
21659	11-9602	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
22629	11-1493	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22707(Del.)	11-2291	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22975	11-7671	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
23093	11-13569	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
23207	11-8667	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
23332	11-8261	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
23352(Rev.)	11-2241	Dep.; $0.50(OTS)
23353	11-7821	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
23729	11-8572	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
24137	11-10953	Dep.; $0.25(OTS)
24258	11-7890	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24282	11-9831	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24500	11-7983	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
25084	11-8668	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25330(Del.)	11-13724	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
25457(Rev.)	11-10411	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
25614	11-8669	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25927	11-9595	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25928	11-8501	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26201	11-9723	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26426	11-8502	Dep.; $0.30(OTS)
26459	11-9316	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
26517	11-11568	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
26531	11-9675	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26566	11-2679	Dep.; $0.15(OTS)
26692	11-13141	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26762	11-8416	Dep.; $0.25(OTS)
26928	11-13054	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
27162	11-11584	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
27297	11-7822	Dep.; $0.30(OTS)
27434	11-8456	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
27489	11-7529	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
27551	11-8670	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
27781	11-4424	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
27784	11-2572	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
27821	11-8374	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28282	11-11699	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28309	11-7902	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28405	11-13666	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28491	11-13749	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28935	11-10857	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
29001	11-8375	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
29082	11-7448	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
29086	11-7427	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
29128	11-8503	Dep.; $0.25(OTS)
29282	11-3952	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29348(Del.)	11-11737	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29453	11-2680	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29569	11-7714	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29757	11-10893	Dep.; $0.25(OTS)
29960	11-7823	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29967 A	11-11971	Dep.; $0.50(OTS)
29987	11-7886	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30198(Del.)	11-11732	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30225	11-3787	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30266	11-7824	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30422	11-8671	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
30451	11-13028	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30500	11-7616	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
30589 (Pts. 1 and 2)	11-9225	Dep.; $30.30(ph OTS); $8.70(mf OTS)
30693	11-2292	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30719	11-7449	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
31096	11-10894	Dep.; $0.25(OTS)
31242	11-67	Dep.; $0.20(OTS)
31300	11-8376	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
31385(Del.)	11-13919	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)

Report	Abstract	Availability
HW		
31837	11-11780	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
31862	11-8573	Dep.; $0.35(OTS)
32175	11-9624	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32347	11-2771	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
32410	11-13694	Dep.(mc); $0.40(OTS)
32417	11-12967	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
32456	11-2418	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
32466	11-7965	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
32476	11-3505	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32642	11-3396	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
32801	11-12476	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32843(Rev.)	11-2824	Dep.; $3.30(ph OTS); $2.40(mf OTS)
32968	11-2764	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
32988	11-13920	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
33006	11-8417	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
33023	11-2419	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
33029(Del.)	11-8742	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
33108	11-2681	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
33148	11-8377	Dep.; $0.35(OTS)
33164	11-12983	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
33414	11-2738	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
33480	11-2580	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
33504	11-2478	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
33911	11-2479	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
33912	11-2114	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
34082	11-12552	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
34083	11-2557	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
34315	11-3445	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
34435	11-2267	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
34502(Rev.)	11-13667	Dep.(mc); $0.30(OTS)
34811	11-11915	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
34820(Del.)	11-13205	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
34868 C 8	11-9899	Dep.; $0.35(OTS)
35009	11-4429	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
35043	11-2255	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
35189	11-8743	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
35457	11-8504	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
35550(Del.)	11-13792	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
35579	11-2250	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
35663	11-2234	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
35746	11-2682	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
35814	11-13029	Dep.(mc); $0.25(OTS)
36125	11-10089	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
36210	11-4540	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
36217	11-1220	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
36301(Del.)	11-2242	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
36478	11-2599	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
36503	11-2683	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
36572	11-2765	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
36836	11-7966	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
36887	11-3781	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
37049	11-7617	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
37077	11-3909	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
37208	11-8672	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
37216(Rev.)	11-11781	Dep.(mc); $0.35(OTS)
37406	11-3727	Dep.(mc); $0.40(OTS)
37680	11-3803	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
37811	11-2684	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
37960	11-3796	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38016	11-11670	Dep.(mc); $0.35(OTS)
38219	11-2385	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38235(Rev.)	11-1616	Dep.; $0.25(OTS)
38242(Rev. 1)	11-8893	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
38422	11-2600	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38453	11-9739	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38495	11-3953	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38496	11-3954	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38583	11-2685	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38686	11-8418	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38780(Rev.)	11-13921	Dep.(mc); $0.25(OTS)
38838	11-2686	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
38918	11-2601	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38987	11-11082	Dep.; $0.20(OTS)
39110	11-2825	Dep.; $6.30(ph OTS); $3.00(mf OTS)
39142	11-1241	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
39338	11-1242	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
39431	11-1243	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39445	11-2687	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
39536	11-2197	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39560	11-2342	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39605	11-2688	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39668	11-649	Dep.(mc); $0.55(OTS)
39820	11-3782	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39821(Rev. 1)	11-11326	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39880	11-13793	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39986	11-10175	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40105	11-877	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
40180	11-1026	See TID-7517(Pt.1)
40250	11-12372	Dep.(mc); $0.35(OTS)
40296	11-4541	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40322	11-5295	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40345(Del.)	11-4013	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
40512	11-11170	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
40544	11-4286	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40778	11-5019	Dep.; $3.30(ph OTS); $2.40(mf OTS)
40801(Rev.)	11-5213	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40804	11-3811	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40820	11-3360	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40930	11-1657	Dep.(mc); $0.40(OTS)
40947	11-1177	J. Appl. Phys. 27, 1294-1300(1956); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
40980	11-7161	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41026(Del.)	11-8257	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report HW	Abstract	Availability
41053	11-1323	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41275	11-49	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
41295	11-3381	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
41307	11-1512	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41325	11-485	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41370	11-270	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41372	11-3840	Dep.; $0.30(OTS)
41394	11-6343	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
41412	11-13852	Dep.(mc); $0.50(OTS)
41439	11-1979	Dep.; $0.30(OTS)
41519	11-13572	Dep.(mc); $0.35(OTS)
41727	11-2891	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41772	11-3841	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41859	11-6369	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
41860	11-7162	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
42030	11-11037	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
42055	11-4682	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
42075	11-3842	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42100	11-3812	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42225	11-3955	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42364	11-1867	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42403	11-11556	Dep.; $0.40(OTS)
42532	11-2223	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
42547	11-4452	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42555	11-3213	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
42585(Rev.)	11-1517	Dep.; $0.25(OTS)
42663(Rev.)	11-3339	Dep.(mc); $0.45(OTS)
42665	11-3072	Dep.; $0.25(OTS)
42884	11-271	Dep.; $0.15(OTS)
42908	11-11782	Dep.; $0.50(OTS)
42947	11-1804	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42969	11-64	Dep.; $0.30(OTS)
42996	11-4845	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43031	11-11783	Dep.(mc); $0.35(OTS)
43049(Rev.)	11-1876	Dep.; $0.25(OTS)
43060	11-7046	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43080	11-2978	Dep.; $0.30(OTS)
43096	11-7110	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43099	11-7068	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43127	11-3504	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
43319	11-985	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43350	11-10114	Acta Met. 5, 398-403(1957)
43395	11-11592	Dep.(mc); $0.35(OTS)
43428	11-3416	Dep.; $0.25(OTS)
43441	11-1275	Dep.; $0.45(OTS)
43463	11-184	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
43541	11-4935	Dep.; $0.20(OTS)
43547(Del)	11-2115	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
43550	11-3956	Dep.; $0.25(OTS)
43557	11-13922	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43579	11-9953	Chem. Eng. Progr. 53, 357-60(1957)
43628	11-3417	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
43744	11-3552	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
43745	11-8003	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43836	11-1761	Dep. $4.80(ph OTS); $2.70(mf OTS)
43922	11-4090	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
44054	11-12228	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
44092	11-5246	Dep.; $0.30(OTS)
44245	11-4895	Welding J. (N. Y.) 36, 240-2(1957)
44281	11-7715	Dep.(mc); $0.35(OTS)
44525	11-2116	Dep.; $0.45(OTS)
44720	11-1558	Dep.; $0.20(OTS)
44749	11-4007	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
44837	11-272	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
44888	11-5762	Dep.; $4.80(ph OTS); $2.70(mf OTS)
44890	11-3321	Dep.; $0.15(OTS)
44905	11-1125	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
44906	11-3418	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
44948	11-6924	Nuclear Sci. and Eng. 2, 219-20(1957)
44989	11-1126	Dep.; $0.20(OTS)
45008	11-11668	Dep.(mc); $0.35(OTS)
45035	11-13618	Dep.(mc); $0.30(OTS)
45149	11-3353	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
45505	11-3322	Dep.; $0.15(OTS)
45513	11-924	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
45567	11-4683	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
45620	11-11623	Dep.(mc); $0.30(OTS)
45711	11-2962	Dep.; $0.15(OTS)
45918	11-3378	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
45964	11-3340	Dep.; $0.15(OTS)
45965	11-4684	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
45983	11-1747	Dep.(mc); $1.80(mf OTS); $1.80(mf OTS)
46013	11-3736	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46065	11-12700	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46094	11-1748	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46150	11-12660	Dep.; $0.50(OTS)
46366	11-11916	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
46369	11-3813	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46409	11-3649	Dep.; $3.30(ph OTS); $2.40(mf OTS)
46483	11-10954	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46697	11-4014	Dep.; $0.20(OTS)
46717	11-3788	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46722	11-13264	Dep.; $0.50(OTS)
46762	11-4422	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46779	11-3814	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46781	11-12885	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
46793	11-3957	Dep.; $0.20(OTS)
47012	11-5493	Dep.; $0.40(OTS)
47015	11-8505	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47017(Del.)	11-5583	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
47022(Rev.)	11-8855	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
HW		
47063	11-3875	Dep.; $0.20(OTS)
47088	11-6698	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
47100	11-12048	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47170	11-3297	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47194	11-8997	Dep.; $0.25(OTS)
47284	11-5040	Dep.; $0.40(OTS)
47500	11-11877	Dep.; $1.25(OTS)
47576	11-5440	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47676	11-7967	Dep.; $0.20(OTS)
47681	11-10057	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
47699	11-6350	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47707	11-6530	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47721 A	11-12838	Dep.; $1.00(OTS)
47721	11-6001	Superseded by HW-47721-A
47799	11-5848	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
47813	11-4318	Dep.; $0.20(OTS)
47884	11-13563	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47892	11-5297	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
47896	11-5828	Dep.; $0.25(OTS)
47921	11-6370	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48480	11-6344	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48712	11-6471	Dep.; $0.25(OTS)
48735	11-6293	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48736	11-11083	Dep.; $0.20(OTS)
48770	11-6254	Dep.; $0.15(OTS)
48832	11-12664	Dep.; $0.75(OTS)
48873	11-13291	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48884	11-12016	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48893	11-8116	Dep.; $0.55(OTS)
48907	11-10284	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
48916	11-7159	Dep.; $0.30(OTS)
49029	11-8170	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
49188	11-9045	Dep.; $0.25(OTS)
49195	11-7160	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49211	11-7960	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49441 A	11-11997	Dep.; $0.20(OTS)
49460	11-7193	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49483 A	11-11972	Dep.; $1.00(OTS)
49542 A	11-11973	Dep.; $1.00(OTS)
49544 A	11-11974	Dep.; $0.75(OTS)
49545 A	11-11174	Dep.; $0.25(OTS)
49549 A	11-11975	Dep.; $0.75(OTS)
49561	11-12809	Dep.; $0.75(OTS)
49567	11-9101	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49597 A	11-11976	Dep.; $0.25(OTS)
49626(Rev.)	11-12685	Dep.; $0.50(OTS)
49631	11-7991	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49652 A	11-11999	Dep.; $0.50(OTS)
49668	11-11084	Dep.; $0.30(OTS)
49697	11-9324	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
49700	11-9474	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49718	11-10648	Dep.; $0.40(OTS)
49815	11-10553	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49840	11-9202	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50131	11-12017	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50311	11-11121	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50339-A2	11-11408	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50363	11-10798	Dep.; $0.20(OTS)
50600	11-11130	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50610	11-11299	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50670	11-11197	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
50675	11-11409	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
50700	11-12229	Dep.; $1.50(OTS)
51171	11-12725	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51175	11-12886	Dep.; $0.75(OTS)
51234-A2	11-11410	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51267	11-12026	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51328	11-12230	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51362	11-12929	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51386	11-11977	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51398	11-12887	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51773	11-12021	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51841	11-11149	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3-3222	11-9836	See M-3743
3-3898	11-2480	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7-5660	11-8666	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
IC-CFL		
56-1	11-628	See AECU-3328
56-2	11-629	See AECU-3329
IC-KAH		
56-8	11-631	See AECU-3341
56-9	11-632	See AECU-3342
IC-LCW		
56-5	11-481	See AECU-3337
56-6	11-225	See AECU-3339
IC-WRP		
56-2	11-630	See AECU-3331
IDO		
14003(Del.)	11-14041	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14035	11-8457	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
14048	11-13030	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
14079	11-2343	Dep.(mc); $25.80(ph OTS); $7.80(mf OTS)
14155	11-8279	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14165	11-2297	Dep.(mc); $63.60(ph OTS); $18.90(mf OTS)
14204(Del.)	11-13000	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14213(Del.)	11-8458	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
14216	11-8378	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
14224	11-13668	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14226	11-11624	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
14243	11-13001	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
IDO		
14246	11-11658	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14312	11-7530	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
14316(Suppl. 1)	11-2826	Dep.; $1.00(OTS)
14316(Suppl. 2)	11-10441	Dep.; $1.00(OTS)
14331	11-7825	Dep.; $0.40(OTS)
14344(Del.)	11-9625	Dep.(mc); $25.80(ph OTS); $7.80(mf OTS)
14345	11-1232	Chem. Eng. Progr. 52, 375-80(1956); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
14348	11-13206	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
14358	11-7531	Dep.; $0.25(OTS)
14371(Rev.)	11-9380	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14376(Del.)	11-13002	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
14379	10-11114	Nucleonics 15, No. 6, 106-10(1957) (Condensed)
14381	11-212	Dep.; $0.35(OTS)
14382(Del.)	11-457	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
14386	11-3354	Dep.; $0.30(OTS)
14387	11-1428	Dep.; $0.20(OTS)
14388	11-1458	Anal. Chem. 29, 19A-21A(1957); Dep.; $0.20(OTS)
14389	11-2827	Dep.; $0.20(OTS)
14392	11-4362	Dep.; $0.20(OTS)
14393	11-4821	Appl. Spectroscopy 11, No. 3, 128-31(1957); Dep.; $0.20(OTS)
14396	11-8856	Dep., $0.70(OTS)
14398	11-7170	Dep.; $0.30(OTS)
14405	11-7945	Dep.; $0.15(OTS)
14406	11-7126	Dep.; $0.25(OTS)
14407	11-10470	Dep.; $0.35(OTS)
14408	11-12373	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
14409	11-8866	Dep.; $0.15(OTS)
14411	11-11085	Dep.; $0.15(OTS)
14416	11-12719	Dep.; $0.75(OTS)
16004	11-1658	Dep.(mc); $45.00(ph OTS); $11.10(mf OTS)
16007	11-2689	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16019	11-8673	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16025	11-8674	Dep.; $0.30(OTS)
16042(Del.)	11-2690	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16046	11-8675	Dep.; $0.25(OTS)
16066	11-8160	Dep.; $0.25(OTS)
16080	11-2691	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16086	11-3379	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16134	11-7826	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16150	11-7827	Dep.; $0.30(OTS)
16156	11-7828	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16164	11-607	Phys. Rev. 103, 1778-86(1956)
16172	11-11827	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16196	11-2692	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16198	11-8676	Dep.; $0.30(OTS)
16254	11-8677	Dep.; $0.30(OTS)
16255	11-5020	Dep.; $0.20(OTS)
16257	11-12968	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
IDO		
16266	11-2693	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16267	11-2694	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16270	11-2758	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16273	11-2344	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16275	11-2623	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16277	11-2624	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16281	11-2507	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16290	11-6927	J. Appl. Phys. 28, 547(1957)
16292	11-2087	Phys. Rev. 104, 1054-8(1956)
16294	11-4166	Dep.(mc); $0.25(OTS)
16297	11-1276	Dep.; $0.70(OTS)
16300	11-1287	Dep.; $0.15(OTS)
16304	11-4642	Phys. Rev. 105, 616-9(1957)
16306	11-3910	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16308	11-2445	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16309	11-650	Dep.; $0.20(OTS)
16311	11-2432	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16314	11-4685	Dep.; $0.45(OTS)
16316	11-9102	Dep.; $0.30(OTS)
16317	11-10729	Dep.; $0.30(OTS)
16318	11-11411	Dep.; $0.30(OTS)
16322	11-6531	Dep.; $0.40(OTS)
16325	11-10730	Dep.; $0.20(OTS)
16326	11-10731	Dep.; $0.20(OTS)
16329	11-8140	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16331	11-9052	Dep.; $0.35(OTS)
16332	11-6895	Dep.; $0.50(OTS)
16337	11-10353	Dep.; $0.20(OTS)
16338	11-10079	Dep.; $0.15(OTS)
16341	11-10285	Dep.(mc); $0.25(OTS)
16343	11-11412	Dep.; $0.45(OTS)
16344	11-13725	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16345	11-14027	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16347	11-13923	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16350	11-13924	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16351	11-13925	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16353	11-13142	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16354	11-13926	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16356	11-14037	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16357	11-13927	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16359	11-13143	Dep.(mc); $0.25(OTS)
16360	11-13830	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16361	11-8171	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16362	11-8080	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16363	11-13144	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16364	11-13207	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16365	11-13145	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16367	11-13146	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16373	11-12888	Dep.; $1.00(OTS)
16375	11-12889	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
IDO		
16382	11-10732	Dep.; $0.15(OTS)
16383	11-12890	Dep.; $0.50(OTS)
16384	11-13495	Dep.; $1.00(OTS)
16389	11-12810	Dep.; $0.50(OTS)
16390	11-13492	Dep.; $0.50(OTS)
16391	11-12854	Dep.; $0.50(OTS)
16394	11-13430	Dep.; $1.75(OTS)
16398	11-13496	Dep.; $0.50(OTS)
24003	11-2766	Dep.(mc); $34.80(ph OTS); $9.90(mf OTS)
24020	11-651	Dep.; $1.75(OTS)
28001	11-12012	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
28002	11-12891	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
28003	11-13308	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
IMCC		
2206	11-988	See RMO-2035
2214	11-930	See RMO-2043
2215	11-5263	See RMO-2044
2216(Del.)	11-10037	See RMO-2045(Del.)
INTERNUC		
2	11-1655	See AECU-3319
6	11-5910	See AECU-3384
9	11-10714	See AECU-3427
9(Add.)	11-11389	See AECU-3427(Add.)
ISC		
14	11-2367	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
25	11-13083	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
36	11-11700	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
49	11-8402	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
69	11-12322	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
130	11-7692	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
186	11-7428	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
200	11-8506	Dep.; $0.70(OTS)
203	11-8507	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
204	11-2915	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
219	11-7672	Dep.; $0.35(OTS)
234	11-7532	Dep.; $0.35(OTS)
248	11-8508	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
251	11-8509	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
274(Rev.)	11-8510	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
290(Rev.)	11-8511	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
297	11-9740	Dep.; $0.50(OTS)
298(Rev.)	11-13669	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
300(Del.)	11-11701	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
314(Del.)	11-11702	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
396	11-11703	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
407	11-11625	Dep.; $0.65(OTS)
415	11-11626	Dep.(mc); $0.60(OTS)
423	11-7673	Dep.; $0.40(OTS)
425	11-7674	Dep.; $0.20(OTS)
506(Del.)	11-11704	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
ISC		
507(Del.)	11-13794	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
519	11-1471	J. Chem. Phys. 25, 917-25, (1956)
531	11-8512	Dep.; $0.40(OTS)
548	11-1827	A.I.Ch.E. Journal 2, 283-9(1956)
568	11-7675	Dep.; $0.40(OTS)
575	11-7676	Dep.; $0.40(OTS)
585	11-1027	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
603	11-999	Iowa State Coll. J. Sci. 31, 25-31(1956)
605	11-2420	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
607(Del.)	11-7677	Dep.(mc); $0.40(OTS)
638	11-2857	Dep.; $0.50(OTS)
651	11-10359	J. Metals 9, 895-7(1957)
659	11-2851	Dep.; $0.40(OTS)
661	11-114	Anal. Chem. 28, 1300-03(1956)
667	11-2828	Dep.; $0.40(OTS)
671	11-1808	Dep.; $0.30(OTS)
672	11-4003	Dep.; $0.30(OTS)
678	11-5258	Dep.; $0.25(OTS)
679	11-5069	Dep.; $0.40(OTS)
687	11-10109	Dep.; $1.50(OTS)
691	11-1010	Iowa State Coll. J. Sci. 31, 33-47(1956)
700	11-5334	Dep.; $0.30(OTS)
701	11-4748	Dep.; $0.40(OTS)
703	11-4843	Dep.; $0.45(OTS)
711	11-121	J. Am. Chem. Soc. 78, 5166-7(1956)
712	11-9990	J. Am. Chem. Soc. 79, 3372-4(1957)
714	11-4453	Dep.; $0.50(OTS)
718	11-2836	Anal. Chem. 29, 158-61(1957)
719	11-2836	Anal. Chem. 29, 158-61(1957)
720	11-312	Dep.; $0.20(OTS)
721	11-937	Anal. Chim. Acta 15, 367-72(1956)
722	11-1012	J. Org. Chem. 21, 815(1956)
723	11-1490	J. Am. Chem. Soc. 78, 4225-9(1956)
724	11-117	Anal. Chim. Acta 15, 356-63(1956)
726	11-6108	Dep.; $0.25(OTS)
727	11-1443	Anal. Chem. 28, 1894-7(1956)
729	11-7210	Dep.; $0.60(OTS)
735	11-12096	J. Chem. Phys. 27, 335-42(1957)
736	11-2871	Progr. Nuclear Energy 1, 322-8(1956)
742	11-7938	J. Electrochem. Soc. 104, 346-9(1957)
745	11-9220	J. Electrochem. Soc. 104, 434-9(1957)
751	11-8842	Anal. Chem. 29, 995-8(1957)
752	11-6248	J. Electrochem. Soc. 104, 299-300(1957)
757	11-4810	Dep.; $0.40(OTS)
758	11-4632	Dep.; $0.25(OTS)
759	11-4454	Dep.; $0.30(OTS)
760	11-1810	Dep.; $0.30(OTS)
761	11-1877	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
764	11-7151	J. Phys. Chem. 61, 573-7(1957)
766	11-11111	Dep.; $1.25(OTS)

Report	Abstract	Availability
ISC		
772	11-6261	Anal. Chem. 29, 821-5(1957)
775	11-8846	Anal. Chem. 29, 1079-84(1957)
777	11-8820	Dep.; $0.40(OTS)
778	11-7937	J. Am. Chem. Soc. 79, 2440-3(1957)
779	11-12732	Dep.; $1.25(OTS)
784	11-7217	J. Appl. Phys. 28, 583-6(1957)
788	11-5049	Phys. Rev. 105, 1310-11(1957)
793	11-1811	Dep.; $0.15(OTS)
794	11-2813	Dep.; $0.15(OTS)
795	11-1878	Dep.; $0.25(OTS)
796	11-10471	Dep.; $0.25(OTS)
800	11-9518	Phys. Rev. 106, 1001-7(1957)
801	11-6755	Acta Cryst. 10, 341-2(1957)
802	11-5259	Dep.; $0.40(OTS)
804	11-4542	Dep.; $0.30(OTS)
810	11-9251	J. Chem. Phys. 26, 1345-6(1957)
811	11-12298	J. Chem. Phys. 27, 394-9(1957)
812	11-4879	Dep.; $0.30(OTS)
813	11-13518	Phys. Rev. 107, 1058-61(1957)
815	11-9237	J. Am. Chem. Soc. 79, 3017-20(1957)
817	11-8045	Phys. Rev. 106, 723-5(1957)
824	11-9444	Anals of Physics 1, 213-20(1957)
825	11-13271	Anal. Chem. 29, 1412-17(1957)
827	11-9217	J. Am. Chem. Soc. 79, 3020-4(1957)
829	11-12136	Acta Cryst. 10, 464(1957)
833	11-8117	Dep.; $0.30(OTS)
834	11-10428	Dep.; $0.30(OTS)
836	11-11055	Dep.; $0.75(OTS)
837	11-9325	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
840	11-12910	Phys. Rev. 107, 772-4(1957)
841	11-11978	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
861	11-11381	Phys. Rev. 107, 638(1957)
JE		
51-6	11-11705	Dep.(mc); $0.35(OTS)
K		
48	11-2602	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
78	11-2386	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
98	11-8419	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
126	11-13147	Dep.(mc); $0.40(OTS)
145	11-13695	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
190	11-2603	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
215	11-8420	Dep.; $0.30(OTS)
220(2(Del.))	11-11650	Dep.(mc); $66.60(ph OTS); $11.10(mf OTS)
340	11-8421	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
307	11-8553	Dep.; $0.30(OTS)
314	11-13148	Dep.(mc); $0.25(OTS)
324	11-2582	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
343	11-13855	Dep.(mc); $0.45(OTS)
374	11-11735	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
K		
398	11-11659	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
405	11-9724	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
406	11-11006	Dep.; $0.30(OTS)
417	11-2387	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
429	11-8422	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
444	11-11660	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
483	11-13591	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
548	11-8423	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
587	11-13696	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
643	11-11007	Dep.; $0.40(OTS)
649(Del.)	11-2289	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
662	11-11738	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
681	11-10845	Dep.; $0.45(OTS)
721	11-10816	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
725	11-12374	Dep.(mc); $0.30(OTS)
727(Del.)	11-12420	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
749	11-2573	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
756	11-2268	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
785	11-2604	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
789	11-12344	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
792	11-2433	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
817	11-8379	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
819(Del.)	11-11661	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
831	11-10846	Dep.; $0.30(OTS)
847	11-10847	Dep.; $0.30(OTS)
849	11-10848	Dep.; $0.40(OTS)
866	11-12442	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
882	11-8424	Dep.; $0.35(OTS)
903	11-13003	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
905	11-8753	Dep.; $0.30(OTS)
931	11-8303	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
999	11-2605	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1012	11-10849	Dep.; $0.30(OTS)
1013(Del.)	11-10822	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1049	11-10907	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1064	11-10823	Dep.; $0.25(OTS)
1076	11-8294	Dep.; $0.30(OTS)
1083	11-12514	Dep.(mc); $0.25(OTS)
1095	11-13211	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1114	11-13697	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1137	11-8425	Dep.; $0.30(OTS)
1141	11-11828	Dep.; $0.25(OTS)
1173	11-8678	Dep.; $0.50(OTS)
1179	11-10022	J. Chem. Phys. 27, 223-6(1957)
1184	11-8426	Dep.; $0.25(OTS)
1199	11-8295	Dep.; $0.25(OTS)
1201	11-8427	Dep.; $0.30(OTS)
1208	11-2272	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1219	11-987	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1221	11-11249	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1260	11-13831	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1279	11-8304	Dep.; $0.40(OTS)

Report	Abstract	Availability
K		
1280	11-412	Dep.(mc); $0.20(OTS)
1282	11-7251	Rev. Sci. Instr. 28, 324-5(1957)
1288	11-3843	Dep.; $0.30(OTS)
1289	11-13847	Dep.(mc); $0.30(OTS)
1302(Pt. 2)	11-4415	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1302(Pt. 3)	11-5404	Dep.; $7.80(ph OTS); $3.30(mf OTS)
1302(Pt.3 (Add.))	11-12769	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1302(Pt. 4)	11-5405	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1302(Pt. 5)	11-10611	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1302(Pt.6)	11-12721	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1306	11-2224	Dep.; $0.35(OTS)
1309	11-13853	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1312	11-2886	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1314	11-11056	Dep.; $0.20(OTS)
1316	11-11250	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1317	11-13832	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1322	11-5428	Dep.; $0.70(OTS)
1323	11-4393	Dep.; $0.25(OTS)
1330	11-8986	Dep.; $1.75(OTS)
1334	11-8998	Dep.; $0.25(OTS)
1340	11-10456	Dep.; $0.75(OTS)
1341	11-12799	Dep.; $1.75(OTS)
1342	11-11251	Dep.; $0.75(OTS)
1344	11-12650	Dep.; $0.50(OTS)
1345	11-12803	Dep.; $0.50(OTS)
1346	11-13356	Dep.; $0.75(OTS)
KAPL		
39	11-7829	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
44	11-7830	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
76	11-9893	Dep.; $0.25(OTS)
89	11-7533	Dep.; $3.30(ph OTS); $2.40(mf OTS)
95	11-12553	Dep.(mc); $0.25(OTS)
98	11-2695	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
99	11-13670	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
100	11-9832	Dep.; $0.30(OTS)
101	11-13564	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
107	11-13216	Dep.(mc); $0.25(OTS)
113	11-2508	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
116	11-12554	Dep.(mc); $25.80(ph OTS); $7.80(mf OTS)
117	11-8433	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
201	11-13217	Dep.(mc); $0.25(OTS)
213(Del.)	11-13004	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
223(Del.)	11-11627	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
257	11-11784	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
267	11-11785	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
287(Rev.)	11-8679	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
314	11-7534	Dep.; $0.50(OTS)
317	11-2751	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
321	11-7678	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
326	11-2269	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
328	11-13671	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
KAPL		
335	11-13833	Dep.(mc); $0.20(OTS)
340(Del.)	11-12555	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
341(Del.)	11-13149	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
346	11-7831	Dep.; $0.40(OTS)
347	11-7832	Dep.; $0.35(OTS)
364(Pt. III)	11-8888	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
391	11-2472	Dep.(mc); $4.80(ph OTS); $2.40(mf OTS)
410	11-11786	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
423	11-8680	Dep.; $0.45(OTS)
436(Suppl. 1)	11-13928	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
448	11-2767	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
492	11-2243	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
521	11-2446	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
534(Del.)	11-13047	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
537	11-9607	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
541	11-11787	Dep.(mc); $0.25(OTS)
552	11-7833	Dep.; $0.25(OTS)
557	11-2251	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
575	11-2553	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
585	11-2421	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
589	11-2422	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
609	11-7453	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
649	11-7593	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
704	11-13218	Dep.(mc); $0.20(OTS)
743	11-13150	Dep.(mc); $0.30(OTS)
795(Del.)	11-12375	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
814	11-9577	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
818	11-7834	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
849	11-2474	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
863	11-7400	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
876(Del.)	11-13084	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
890(Rev.)	11-11585	Dep.(mc); $0.80(OTS)
891	11-2468	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
903	11-13085	Dep.(mc); $0.25(OTS)
938	11-12979	Dep.(mc); $0.25(OTS)
951(Rev. 1)	11-11162	Dep.; $0.30(OTS)
954(Del.)	11-12624	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
988	11-13929	Dep.(mc); $0.25(OTS)
997	11-8790	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1014	11-8837	Dep.(mc); $0.30(OTS)
1019(Del.)	11-13795	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1021	11-2447	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1044	11-9900	Dep.; $0.25(OTS)
1079	11-2448	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1091	11-14028	Dep.(mc); $0.25(OTS)
1097	11-1016	Dep.; $0.30(OTS)
1099	11-8791	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1102	11-7903	Dep.; $0.30(OTS)
1104	11-10895	Dep.; $0.35(OTS)
1117	11-2606	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1134(Del.)	11-2754	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
KAPL		
1176	11-2271	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1177	11-2475	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1226	11-1324	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1235	11-2696	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1247	11-2574	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1268	11-8792	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1283	11-2607	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS).
1313	11-7920	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1346	11-12504	Dep.(mc); $0.30(OTS)
1354(Rev.)	11-13086	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1380(Del.)	11-13087	Dep.(mc); $0.40(OTS)
1410	11-2979	Dep.; $0.50(OTS)
1439	11-3669	Dep.; $0.25(OTS)
1441	11-4180	Dep.; $0.20(OTS)
1456	11-7931	Dep.; $0.35(OTS)
1466	11-13930	Dep.(mc); $0.35(OTS)
1468(Del.)	11-11728	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1475	11-13737	Dep.(mc); $0.20(OTS)
1477	11-3697	Dep.; $0.45(OTS)
1495	11-12323	Dep.(mc); $0.25(OTS)
1515	11-13834	Dep.(mc); $0.40(OTS)
1516	11-4569	Dep.; $0.30(OTS)
1518	11-7968	Dep.; $0.40(OTS)
1525	11-12477	Dep.(mc); $0.30(OTS)
1526(Del.)	11-13088	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1549	11-1325	Dep.; $0.45(OTS)
1550	11-2117	Dep.; $0.40(OTS)
1556	11-8754	Dep.; $0.35(OTS)
1562	11-9741	Dep.(mc); $0.25(OTS)
1565	11-9771	Dep.; $0.45(OTS)
1572	11-8793	Dep.; $0.45(OTS)
1592	11-226	Arch. Ind. Health 15, 3-8(1957) Jan.; Dep.; $4.80(ph OTS); $2.70(mf OTS)
1597	11-1265	Dep.; $0.30(OTS)
1601	11-4687	Dep.(mc); $0.30(OTS)
1607	11-970	Dep.; $0.20(OTS)
1612	11-1956	Dep.; $0.25(OTS)
1615	11-6209	Dep.; $0.35(OTS)
1635	11-4633	Dep.; $0.25(OTS)
1638	11-6459	Dep.; $0.20(OTS)
1641	11-5584	Dep.; $0.35(OTS)
1642	11-11415	Dep.; $0.45(OTS)
1643	11-3027	Dep.; $0.30(OTS)
1645	11-6084	Dep.; $0.60(OTS)
1648	11-4822	Dep.; $0.20(OTS)
1653	11-3328	Dep.; $0.25(OTS)
1657	11-11327	Dep.; $0.25(OTS)
1660	11-9772	Dep.; $0.50(OTS)
1667	11-4811	Dep.; $0.40(OTS)
1668	11-7383	Dep.; $0.25(OTS)
1674	11-12757	Dep.; $1.50(OTS)
1689	11-4248	Dep.; $0.30(OTS)
1690	11-5585	Dep.; $0.25(OTS)
1692	11-10472	Dep.; $0.30(OTS)
1693	11-9254	Dep.; $0.20(OTS)
1698	11-5066	Dep.; $0.20(OTS)
1699	11-5731	Dep.; $0.30(OTS)
1703	11-13497	Dep.; $1.00(OTS)
1720	11-12777	Dep.; $1.25(OTS)
1724	11-8081	Dep.(mc); $0.65(OTS)
1726	11-10733	Dep.; $0.25(OTS)
1739	11-10535	Dep.; $0.20(OTS)
1741	11-10536	Dep.; $0.20(OTS)
1742	11-9156	Dep.; $0.30(OTS)
1743	11-6311	Dep.; $0.20(OTS)
1746	11-9326	Dep.; $0.25(OTS)
1748	11-8868	Dep.; $0.25(OTS)
1754	11-12232	Dep.; $1.75(OTS)
1759	11-12811	Dep.; $0.75(OTS)
1763	11-8919	Dep.; $0.30(OTS)
1765	11-9269	Dep.; $0.25(OTS)
1768	11-10464	Dep.; $0.20(OTS)
1770	11-7328	Dep.; $0.45(OTS)
1773	11-10586	Dep.; $0.30(OTS)
1776	11-10460	Dep.; $0.20(OTS)
1779	11-10554	Dep.; $0.20(OTS)
1781	11-13443	Dep.; $1.00(OTS)
1787	11-13498	Dep.; $0.75(OTS)
1792	11-9278	Dep.; $0.30(OTS)
1793	11-11359	Dep.; $0.20(OTS)
1808	11-12701	Dep.; $0.35(OTS)
1811	11-11184	Dep.; $0.25(OTS)
1831	11-12651	Dep.; $0.75(OTS)
KAPL-M		
AAS-1	11-11956	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
ABR-2	11-9290	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
AGR-1	11-11416	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
AJB-2	11-11706	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
AJC-1	11-10896	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AJH-3	11-13711	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
ALM-3	11-6896	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
ALM-4	11-13357	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
AME-1	11-1962	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AME-2	11-3397	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AME-3	11-4919	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
AME-4	11-9327	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
AME-5	11-6737	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AME-6	11-8172	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
AME-7	11-8004	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
KAPL-M		
AME-9	11-12724	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AMS-7	11-13151	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
BES-1	11-6005	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BES-2	11-11417	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BES-3	11-12892	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
BFK-1	11-12839	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CCR-1	11-13733	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CDB-3	11-2434	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CJB-2	11-13152	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CJH-2	11-594	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
CJR-2	11-2196	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CJR-3	11-6085	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
CME-2	11-13796	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CTL-1	11-11957	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CTW-1	11-13797	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CTW-2	11-5335	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CVL-4(Del.)	11-14042	Dep.(mc); $0.30(OTS)
DAM-1	11-10868	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
DBK-1	11-1879	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
DBK-2	11-6371	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
DBK-2(Suppl. 1)	11-6372	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DBK-3	11-9328	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DCB-1	11-1868	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DCB-2	11-11185	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DCS-2	11-12519	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DD-1	11-2697	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
DDA-2	11-13712	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DDL-1	11-4837	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DGC-24	11-12452	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
DJO-3	11-10515	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
DJS-1	11-11628	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DJS-2	11-13672	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DND-2	11-3844	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
DPT-8	11-2435	Dep.; $0.25(OTS)
DRB-1	11-1659	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
DRM-12	11-13713	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
DWJ-5	11-13931	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
EAL-16	11-12556	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
EBF-6	11-13850	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EBF-7	11-9103	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EDL-10	11-13153	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
EDL-33	11-12557	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
EDL-34	11-11671	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EDL-54	11-12512	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EDL-59	11-10862	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EDL-60	11-12558	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EDL-61	11-13714	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EDL-72	11-12559	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EDL-73	11-12449	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
KAPL-M		
EDL-98	11-12450	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
EDL-100	11-11569	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EDL-103	11-13932	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
EDL-107(Pt. 2)	11-13933	Dep.(mc); $45.00(ph OTS); $11.10(mf OTS)
EDL-113	11-10955	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EDL-120	11-11788	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
EDL-121	11-11789	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EDL-122	11-12560	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EDL-123	11-6897	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EDL-124	11-3553	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
EEB-13(Del.)	11-2509	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EEB-16	11-10555	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
EFC-2	11-10916	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
EFC-3	11-2160	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
EGB-4	11-2481	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
EGB-19	11-12467	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
EGB-22	11-10877	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
EGB-23	11-10878	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EJ-4	11-10956	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EJP-2	11-3789	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
EL-1	11-13154	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
ELS-3	11-13155	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
ELS-7	11-13267	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
ELW-1	11-2698	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
ELW-2	11-2699	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
ELW-3	11-13934	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
ELW-5	11-13935	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
ERH-1	11-13089	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
FAW-2	11-13106	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
FDJ-4	11-10957	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
GDC-5	11-12451	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
GDC-6	11-2892	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
GEG-4	11-2482	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
GEG-5	11-13750	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GEG-7	11-10879	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GEG-8	11-13629	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
GEG-9	11-10080	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GEG-10	11-13322	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GH-2	11-13936	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
GH-6	11-2544	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
GH-15	11-2545	Dep.; $0.75(OTS)
GJB-2	11-13156	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
GJH-2	11-10911	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
GJS-1	11-11707	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GLP-1	11-7964	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
GMR-3	11-2625	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
GOW-1	11-1521	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HB-2	11-2626	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
HB-3	11-2739	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
KAPL-M		
HB-20	11-11729	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
HB-22	11-11790	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HB-27	11-11791	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HB-33	11-13715	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
HEB-1	11-13336	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
HH-6	11-13835	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
HH-7	11-10958	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
HH-9	11-13937	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HH-10	11-2118	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
HOP-1	11-3467	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
HOS-2	11-13751	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
HOS-3	11-13337	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
IB-11	11-2700	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
IB-13	11-13938	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
IHD-1	11-14035	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
IMC-1	11-2701	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
JA-2	11-11736	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JA-3	11-1978	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JA-4	11-12804	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
JA-5	11-13385	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JAM-1	11-10959	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JBN-9	11-2627	Dep.; $0.15(OTS)
JBP-1	11-13157	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JEB-2	11-8513	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
JEL-1	11-10804	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JGG-1	11-13752	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JHG-3	11-2436	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JJK-1	11-13716	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JJM-1	11-2449	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JKD-8	11-13005	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JKD-10	11-13939	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
JKD-11	11-10734	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JLM-1	11-12345	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JLM-2	11-6256	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JLV-1	11-10960	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JLV-2	11-6373	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JMG-1	11-11708	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JMG-3	11-13798	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JMG-6	11-6374	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JMG-7	11-3554	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JMG-8	11-10081	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JMG-9	11-11198	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JMG-10	11-11199	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JPH-33	11-14029	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JPS-3	11-10961	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JPS-4	11-11001	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
JR-6	11-13607	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JR-7	11-10824	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JR-8	11-1774	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JR-9	11-3696	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JRL-3	11-11792	Dep.; $0.25(OTS)
JRP-1	11-10897	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JRS-6	11-2608	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JRS-7	11-2702	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JS-1	11-13940	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JSB-1	11-11793	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
JWM-1	11-2546	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JWW-1	11-13941	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
JZ-1	11-9833	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JZ-2	11-2450	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
JZ-3	11-2703	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
KAK-5	11-9742	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
KAK-6	11-13942	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
KAK-9	11-13158	Dep.(mc); $51.50(ph OTS); $11.10(mf OTS)
KAK-10	11-13159	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
KDL-1	11-2451	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
KOK-2	11-13090	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
KOK-4	11-13091	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LBV-5	11-2437	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LBV-7	11-11794	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
LD-2	11-13051	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
LFC-1	11-13799	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LFC-2(Del.)	11-13943	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LFC-3	11-2476	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LFC-5	11-2755	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LFC-7	11-2477	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LFE-10	11-1957	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LFE-13	11-2560	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LFE-15	11-2592	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LFE-16	11-2438	Dep.; $0.35(OTS)
LFE-17	11-10908	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LGB-9(Del.)	11-13160	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LGB-10	11-13944	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LGB-12	11-3510	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LHW-4	11-2609	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LHW-5	11-7891	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LLG-8	11-13673	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LMD-2	11-13844	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LML-2	11-12561	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LOB-1	11-13112	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LPP-1	11-11004	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LRB-2	11-11795	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LRB-3	11-13717	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LRM-7	11-9743	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LRM-12	11-13092	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LSB-2	11-12233	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
LT-3	11-2464	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
MAA-1	11-11418	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
MBR-2	11-2575	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
KAPL-M		
MBR-4	11-12421	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
MC-2	11-10625	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
MEB-1	11-13592	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MHS-22	11-12562	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MJA-2	11-10962	Dep.(mc); $7.80(ph OTS); $3.30(ph OTS)
MLS-2	11-2616	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
MLS-8	11-13856	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
MSN-4	11-12563	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MSN-5	11-14025	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
NCF-1	11-10912	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
NEC-9(Del.)	11-13047	See KAPL-534(Del.)
NEF-1	11-12324	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
NGM-2	11-12564	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
PF-4	11-2439	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
PHK-1	11-10807	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PHK-2	11-13624	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
PL-1	11-10286	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
PLH-16	11-13161	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
POS-1	11-4167	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
POS-2	11-9241	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RBM-2	11-13726	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
RBM-3	11-13946	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RCD-11	11-12447	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RCD-14	11-11796	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RCD-29	11-12565	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RCD-34	11-10963	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RCD-37	11-1880	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RCR-1	11-12566	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RCR-4	11-6532	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RCR-5	11-10735	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RE-7	11-13945	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
RE-8	11-11797	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RE-107A	11-2704	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
Redox-2	11-8380	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RES-1	11-13848	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RES-29	11-13718	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RES-31	11-10863	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
RES-33	11-3382	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RES-37	11-10059	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RES-40	11-13499	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RES-47	11-13500	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RES-48	11-13310	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RFK-5	11-2452	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RFL-8	11-11200	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RFL-9	11-13314	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RGK-1	11-13045	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RGK-10	11-13162	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RGK-12	11-2440	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
KAPL-M		
RGK-17	11-2441	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RJF-4	11-11786	See KAPL-410
RLM-3	11-2705	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RLM-5	11-13800	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
RLM-8	11-13801	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RLM-11	11-10556	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RLM-12	11-11201	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
RLN-2	11-12567	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RNH-1	11-13802	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RNH-2	11-13593	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RSM-1	11-9714	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RTF-4	11-2119	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RTF-5	11-10913	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RTF-6	11-2018	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RWD-1	11-13163	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RWD-3	11-2628	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RWD-6	11-2617	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RWD-13	11-10914	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RWD-15	11-10917	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RWD-17	11-4091	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
RWD-18	11-9104	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RWL-4	11-13947	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
S3G-RE-423	11-10981	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
S3G-RE-502	11-10964	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
S3G-RE-507	11-10965	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
S3G-RE-514	11-10861	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
S3G-RES-23	11-12568	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
SAT-1	11-1522	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
SAT-2	11-1881	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
SAT-3	11-9475	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
SAT-4	11-9282	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SES-12	11-13110	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
SMS-6	11-2706	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
SMS-13	11-13948	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
SMS-14	11-10864	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
SMS-36	11-3555	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
SMS-46	11-5021	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
SMS-50	11-3556	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SMS-52	11-3790	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SMS-55	11-4092	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SMS-58	11-9476	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
SMS-65	11-12234	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
SMS-67	11-11252	Dep.; $3.30(ph OTS); $2.40(mf OTS)
SMS-70	11-12235	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
SMS-72	11-12236	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SMS-74	11-13501	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SMS-75	11-12237	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
SP-10	11-12238	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
KAPL-M		
SSD-16(Rev. B)	11-9477	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
SWK-7	11-9105	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
TFF-1	11-12051	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
TWT-1	11-12893	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
UM-4	11-2483	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
UM-6	11-10880	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
VFC-1	11-10817	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAN-7(Del.)	11-8681	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WBL-1	11-10636	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
WBW-2	11-3005	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WBW-3	11-12894	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
WCJ-2	11-13502	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WEC-10	11-8890	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WEJ-3	11-3383	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
WER-4	11-12742	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WFC-1	11-12720	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WGG-2	11-13949	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WHT-1	11-10859	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WJL-1	11-3074	Dep.; $6.30(ph OTS); $3.00(mf OTS)
WKA-11	11-13631	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WLF-2	11-2510	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WLF-5	11-3791	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
WLR-3	11-5022	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WLR-4	11-5023	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WMC-1	11-13727	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WMC-4	11-9834	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WMK-2	11-2423	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WON-3	11-11419	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WRP-2	11-13950	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WVJ-2	11-13728	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WVJ-3	11-12018	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WWK-5	11-2442	Dep.(mc); $4.80(ph OTS); $2.40(mf OTS)
WWK-8	11-13753	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WWT-1	11-2756	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
KAPL-O		
KPMO-6(Rev. 3)	11-5845	See AECU-3433
KAPL-Spec.		
O-KPMO-31	11-12452	See KAPL-M-DGC-24
KD		
630-2(Del.)	11-13849	See TID-5423(Del.)
664-2(Del.)	11-8995	See AECD-4241
KE		
56-19-R	11-651	See IDO-24020
KLI		
753	11-2378	See AECD-4236
2552	11-2287	See AECU-3240
2616	11-2426	See AECU-3242
KLI		
2749	11-2585	See AECU-3245
3033	11-2379	See AECU-3243
KLO		
103	11-9724	See K-405
120	11-11735	See K-374
121	11-8422	See K-429
124	11-11660	See K-444
KLX		
015(Del.)	11-11672	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
44	11-13708	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
57	11-2757	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
59	11-7535	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
70	11-13006	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
1037	11-13674	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
1040	11-13754	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1042	11-13842	Dep.; $0.40(OTS)
1063	11-7440	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1067	11-8441	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1201	11-9626	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1203	11-9627	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1208	11-9676	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1207	11-12376	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1209	11-9628	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1210	11-13031	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1211	11-11570	Dep.(mc); $0.30(OTS)
1217	11-11629	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1218	11-12377	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1220	11-9629	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1221	11-9630	Dep.; $0.35(OTS)
1223	11-9631	Dep.(mc); $0.45(OTS)
1224(Del.)	11-9632	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1226(Del.)	11-11571	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1302	11-8434	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1329	11-11630	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1361	11-7700	Dep.; $0.55(OTS)
1372	11-11631	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
1394(Del.)	11-8280	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1601	11-11632	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1602	11-11633	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1603	11-7835	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1605	11-13675	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1606	11-13676	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1607	11-8381	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1608	11-11634	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1609	11-11798	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1610	11-13007	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1611	11-13677	Dep.; $0.45(OTS)
1612	11-13698	Dep.; $0.50(OTS)
1613	11-7836	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
KLX		
1616	11-7837	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1704	11-9633	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1711	11-11635	Dep.(mc); $0.35(OTS)
1720	11-8382	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1721	11-8514	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1722	11-8383	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1737	11-13093	Dep.(mc); $0.45(OTS)
1739	11-11662	Dep.(mc); $0.35(OTS)
1741	11-7536	Dep.(mc); $0.25(OTS)
10000	11-13951	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
10012	11-11636	Dep.(mc); $0.35(OTS)
10020	11-11637	Dep.(mc); $0.35(OTS)
10026	11-7838	Dep.; $0.35(OTS)
10029	11-11572	Dep.; $0.30(OTS)
10034	11-11638	Dep.(mc); $0.30(OTS)
10041	11-11573	Dep.; $0.25(OTS)
10042	11-1882	See PWAC-158
10045	11-5024	Dep.(mc); $0.35(OTS)
10056	11-4880	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
10057	11-4430	Dep.; $3.30(ph OTS); $2.40(mf OTS)
10066	11-9255	Dep.(mc); $0.35(OTS)
10078	11-10473	Dep.(mc); $0.50(OTS)
KOA		
283	11-13377	See AECU-3564
KS		
89	11-5079	See AECD-3740
213	11-2238	See AECD-3753
215(Del.)	11-11799	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
219	11-11008	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
317(Del.)	11-12633	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
461	11-2884	See AECD-3737
499	11-3946	See AECU-3249
KT		
69	11-13008	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
70	11-12378	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
71	11-11639	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
76	11-2470	See AECU-3244
77	11-2306	See AECU-3246
79	11-11640	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
84	11-11641	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
86	11-2247	See AECD-3742
89	11-2490	See AECD-3743
90	11-2425	See AECU-3241
95	11-9756	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
97	11-9706	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
109	11-3885	See AECU-3200
123	11-2248	See AECU-3247
148	11-11642	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
178	11-12569	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)

Report	Abstract	Availability
KT		
188	11-10966	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
210	11-3873	See AECU-3292
240	11-12870	See AECU-3555
KY		
191	11-142	Dep.; $0.20(OTS)
LA		
524 (Del.)	11-1637	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
608	11-12181	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1092	11-2235	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1133(Del.)	11-13738	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1138	11-2270	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1159(Del.)	11-4093	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1178	11-11709	Dep.; $0.45(OTS)
1192	11-13952	Dep.; $0.45(OTS)
1202	11-12478	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1244	11-13803	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1273	11-11730	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1355	11-2484	Dep.; $0.25(OTS)
1390	11-12413	Dep.(mc); $0.30(OTS)
1390(Del.)	11-1523	
1391	11-13854	Dep.(mc); $0.40(OTS)
1394	11-2829	Dep. $4.80(ph OTS); $2.70(mf OTS)
1399	11-2740	Dep.; $0.15(OTS)
1405(Del.)	11-12479	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1432	11-2558	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1440	11-2236	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1441	11-2120	Dep.(mc); $0.40(OTS)
1564	11-12455	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1575	11-12570	Dep.(mc); $0.30(OTS)
1577	11-2485	Dep.; $0.25(OTS)
1579	11-13164	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1581	11-12505	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1605	11-12480	Dep.(mc); $0.25(OTS)
1614	11-13953	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1619	11-12481	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
1645(Del.)	11-2273	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1653	11-13954	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1660	11-9329	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
1678	11-2274	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1683	11-2610	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1691	11-12454	Dep.(mc); $0.25(OTS)
1708	11-13955	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
1716	11-12506	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1732	11-12571	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1843(Del.)	11-12346	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1860	11-13032	Dep.(mc); $0.30(OTS)
1869	11-12414	Dep; $0.75(OTS)
1874	11-13956	Dep.(mc); $0.40(OTS)

Report	Abstract	Availability
LA		
1916	11-1288	Dep.; $0.30(OTS)
1934	11-8823	Dep.; $0.25(OTS)
1936	11-10430	Dep.; $0.30(OTS)
1942	11-4688	Dep.; $0.20(OTS)
1944	11-13840	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1948	11-13608	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1957	11-13606	Dep.; $0.35(OTS)
1959	11-1076	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1962	11-1215	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1964	11-1266	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1970	11-3506	pp. 191-225 in "Progress in Nuclear Energy," Vol. 1, Series 1. London-New York, Pergamon Press, 1956. Dep.; $0.35(OTS)
1986	11-19	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1996	11-1019	J. Am. Chem. Soc. 79, 4298-4305(1957); Dep.; $0.50(OTS)
2014	11-4974	Dep.; $1.25(OTS)
2032	11-925	Dep.; $0.20(OTS)
2043	11-1837	Dep.; $0.40(OTS)
2048UNM	11-76	Dep.; $0.15(OTS)
2049	11-926	Dep.; $0.20(OTS)
2052	11-13165	Dep.(mc); $0.45(OTS)
2054UNM	11-10035	Dep.; $1.00(OTS)
2055	11-444	Dep.; $1.75(OTS)
2057	11-1963	Dep.; $0.25(OTS)
2059	11-2225	Dep.; $0.15(OTS)
2069	11-1580	Dep.; $0.20(OTS)
2076	11-4831	Dep.; $0.25(OTS)
2083	11-3944	Dep.; $0.35(OTS)
2084	11-3468	Dep.; $0.20(OTS)
2095	11-13389	Dep.; $1.00(OTS)
2097	11-6131	Dep.; $0.20(OTS)
2099	11-7285	Dep.; $1.00(OTS)
2106	11-7258	Dep.; $0.60(OTS)
2110	11-5368	Dep.; $0.70(OTS)
2112	11-7329	Dep.; $0.20(OTS)
2114	11-7311	Dep.; $3.30(ph OTS); $2.40(mf OTS)
2122	11-10697	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2123	11-8969	Dep.; $0.25(OTS)
2127	11-9442	Dep.; $0.40(OTS)
2129	11-10516	Dep.; $0.50(OTS)
2136	11-13338	Dep.; $1.25(OTS)
LAMS		
618	11-2576	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
665	11-2252	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
786	11-13166	Dep.(mc); $4.80(ph OTS); $3.70(mf OTS)
907	11-11829	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1090	11-2618	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1522	11-3007	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1611(Del.)	11-11420	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
LAMS		
2100	11-5964	Dep.; $0.15(OTS)
2102	11-7342	Dep.; $0.65(OTS)
2126	11-9106	Dep.; $0.15(OTS)
LFR		
3	11-8331	See BNL-125
LP-		
146(Del.)	11-7961	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LRL		
14	11-8438	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51	11-7868	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53	11-9880	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
54	11-7869	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
60	11-7870	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
67	11-13192	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
69	11-8729	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
73(Rev.)	11-11643	Dep.(mc); $0.30(OTS)
80	11-9608	Dep.; $0.30(OTS)
81	11-12616	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
84	11-10910	Dep.; $0.25(OTS)
89	11-7871	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
90	11-12617	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
91	11-14017	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
92	11-13193	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
93	11-12618	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
96	11-12619	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
102(Del.)	11-12620	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
106	11-14018	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
107	11-9835	Dep.; $0.25(OTS)
109	11-12507	Dep.(mc); $0.25(OTS)
110	11-8565	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
114	11-7872	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
118	11-10996	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
119	11-8730	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
123	11-12621	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
125	11-7873	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
131	11-7874	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
132	11-7875	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
135(Rev.)	11-12482	Dep.(mc); $0.30(OTS)
147	11-7876	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
159	11-7877	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LWS		
2232	11-8438	See LRL-14
12008	11-11816	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
22248	11-8731	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22505	11-8744	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
22534	11-7839	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
22654	11-8384	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
22659	11-8544	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
22702	11-8545	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
22708(Del.)	11-13167	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)

Report	Abstract	Availability
LWS		
22710	11-13957	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
23064	11-7867	See CRD-T2B-45
23069	11-8483	See CRD-T2B-49
23073	11-13826	See CRD-T2A-41
24170	11-13746	See CRD-T2C-63
24171	11-13827	See CRD-T4A-75
24295	11-13202	See CRD-T2C-108
24317(Del.)	11-9881	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
24318	11-7878	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24333	11-13201	See CRD-T2C-106
24418	11-8732	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24442	11-13828	See CRD-T4A-126
24477	11-11817	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24478	11-13829	See CRD-T4A-140
24525	11-8439	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24589	11-13194	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24610	11-9882	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
24612	11-7840	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24620	11-8317	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24632	11-13044	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
24680(Del. 2)	11-13917	See CRD-R-21(Del. 2)
24701	11-8682	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24712	11-13107	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24719	11-13168	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24730	11-8566	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24733	11-2707	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24734	11-12629	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24736(Del.)	11-13195	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
24753	11-7817	See CRD-R-33
24806	11-2708	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24898(Del.)	11-13094	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24923	11-12483	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24944(Del.)	11-13169	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
29061	11-12962	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29063	11-8546	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
29066	11-2709	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
30103	11-11819	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
M (Misc.)		
333(Pt. IV)	11-12379	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
895	11-3797	See RL-8.6.5
913	11-12325	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2126	11-2388	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2150	11-12484	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2488	11-6661	See AECD-3690
2765	11-12380	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2934	11-13009	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2948	11-10850	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3002	11-13010	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
M (Misc.)		
3006	11-12422	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3007	11-10851	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3022	11-8428	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3023	11-10826	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3027	11-12381	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3028	11-11644	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3328	11-12313	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3576	11-12485	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3743	11-9836	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3790	11-12423	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3796(Rev.)	11-13630	Dep.(mc); $0.25(OTS)
3956	11-7841	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3992	11-12486	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3998	11-2710	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4157	11-13958	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
4228	11-2345	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4412(Pts. I-III)	11-2711	Dep.(mc); $55.00(ph OTS); $11.10(mf OTS)
4414	11-2712	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
4416	11-2713	Dep.(mc); $34.80(ph OTS); $9.90(mf OTS)
4512	11-2714	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
4525	11-12382	Dep.(mc); $0.55(OTS)
4541	11-12383	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4549	11-8385	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4562	11-13594	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4563	11-10852	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4575	11-2715	Dep.(mc); $96.30(ph OTS); $11.10(mf OTS)
4589	11-2716	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4596	11-2717	Dep.(mc); $30.30(ph OTS); $8.70(mf OTS)
4609	11-2759	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4740	11-2302	See AECD-3760
4756	11-11967	See AECD-3768
5381	11-13699	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5387	11-10827	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5483	11-9700	See TID-5343
5507	11-13845	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5724	11-2300	See NAA-SR-114(Del.)
5727	11-3544	See ANL-WHZ-250(Del.)
5783(Pt. 2)	11-180	See AECU-3360(Pt. II)
5783(Pt. 1)	11-179	See AECU-3360(Pt. I)
5828	11-18	See AECU-3351
5986	11-5798	See AECU-3428
6146	11-10107	See AECU-3507
MCW		
1	11-7582	Dep.; $0.40(OTS)
2	11-13033	Dep.(mc); $0.30(OTS)
3	11-13011	Dep.(mc); $0.20(OTS)
4	11-9634	Dep.; $0.35(OTS)
6	11-9677	Dep.; $0.25(OTS)

Report	Abstract	Availability
MCW		
7	11-13034	Dep.(mc); $0.45(OTS)
9	11-13035	Dep.(mc); $0.30(OTS)
10	11-2389	Dep.; $0.20(OTS)
11	11-13012	Dep.(mc); $0.25(OTS)
14	11-9635	Dep.; $0.30(OTS)
15	11-13013	Dep.(mc); $0.30(OTS)
18	11-12326	Dep.(mc); $0.30(OTS)
20	11-13014	Dep.(mc); $0.25(OTS)
21(Rev.)	11-11645	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
23	11-12327	Dep.(mc); $0.25(OTS)
24	11-11663	Dep.(mc); $0.30(OTS)
25	11-13036	Dep.(mc); $0.25(OTS)
29	11-7679	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
30	11-8755	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
109	11-12424	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
118	11-12425	Dep.(mc); $0.25(OTS)
127	11-12384	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
138	11-13037	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
144	11-9678	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
161	11-10882	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
162	11-13678	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
178	11-2486	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
179	11-9679	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
191	11-9680	Dep.; $0.25(OTS)
196	11-9583	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
209	11-9681	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
213	11-9682	Dep.; $0.20(OTS)
214	11-9683	Dep.; $0.20(OTS)
215	11-9684	Dep.; $0.25(OTS)
217	11-9685	Dep.; $0.25(OTS)
218	11-10853	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
220	11-9686	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
221	11-13679	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
222	11-10828	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
225	11-9687	Dep.; $0.25(OTS)
227	11-9688	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
246	11-9689	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
249	11-9690	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
254	11-9636	Dep.; $0.25(OTS)
1384	11-2814	Dep.(mc); $0.35(OTS)
1387	11-13038	Dep.(mc); $1.60(OTS)
Memo-NEC		
12	11-9607	See KAPL-537
16	11-11787	See KAPL-541
Memo-PRM		
1	11-7834	See KAPL-818
MIT		
1004	11-8515	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
1045(Pt. 2)	11-13804	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MIT		
1049	11-2275	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1052(Pt. 2)	11-12426	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1065	11-8516	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1078(Del.)	11-13805	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
1086	11-8517	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
1102	11-8518	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
1108	11-8519	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
1109	11-7680	Dep.; $0.30(OTS)
1111	11-8520	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
1115	11-7681	Dep.; $0.75(OTS)
5000	11-11800	Dep.; $1.60(OTS)
5003(Del.)	11-13959	Dep.; $2.20(OTS)
5007	11-11421	Dep.; $4.00(OTS)
MIT-EJF		
2	11-8521	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MIT-S		
32	11-3784	See NYO-7179
MITG		
207	11-2390	Dep.; $0.25(OTS)
212	11-2346	Dep.; $0.30(OTS)
218	11-2391	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
220	11-2276	Dep.; $0.25(OTS)
222	11-2347	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
247(Del.)	11-13015	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
261	11-2392	Dep.; $0.20(OTS)
517	11-12385	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
520	11-7537	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
525	11-7538	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MITG-A		
39	11-7583	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49	11-2393	Dep.; $0.25(OTS)
51	11-2394	Dep.; $0.25(OTS)
52	11-2277	Dep.; $0.25(OTS)
53	11-2348	Dep.; $0.25(OTS)
62	11-2395	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
63	11-2349	Dep.; $0.30(OTS)
64	11-2350	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
75	11-2396	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
76	11-2351	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
81	11-2352	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
86	11-2397	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
88	11-7584	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
99	11-9744	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
MITS		
33	11-4861	See NYO-7699
34	11-6237	See NYO-7705
ML		
303	11-1354	See AECU-3198

Report	Abstract	Availability
MLM		
21(Del.)	11-2830	Dep.; $3.30(ph OTS); $2.40(mf OTS)
272	11-13570	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
368-1(Extract)	11-13595	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
471-1	11-2245	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
475	11-11646	Dep.; $0.60(OTS)
498	11-12328	Dep.(mc); $0.60(OTS)
532	11-2411	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
534	11-11917	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
579	11-12440	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
614	11-7594	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
615	11-7098	J. Chem. Phys. 26, 1269-71(1957) (Condensed)
652	11-8435	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
664	11-11979	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
672	11-12441	Dep.(mc); $0.25(OTS)
744	11-10920	Dep.; $0.25(OTS)
835	11-12386	Dep.(mc); $0.35(OTS)
961	11-4802	Dep.; $0.25(OTS)
986	11-1775	Dep.; $1.80(ph OTS); $1.80(mf OTS)
1021	11-213	Dep.; $0.25(OTS)
1023	11-458	Dep.; $0.30(OTS)
MMPP		
75-2	11-2631	See AECD-3669
75-3	11-8173	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MonC		
35	11-13687	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
390	11-9584	Dep.(mc); $0.25(OTS)
416	11-2980	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
MonH		
258	11-2412	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MonN		
36	11-12329	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
108	11-13960	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
119	11-2298	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
123	11-12387	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
125	11-7539	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
127	11-7540	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
136	11-12388	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
146	11-7682	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
188(Bks. I and II)	11-2718	Dep.(mc); $33.30(ph OTS); $9.60(mf OTS)
268	11-7585	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
292	11-8683	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
311	11-12330	Dep.(mc); $39.60(ph OTS); $11.10(mf OTS)
319	11-10833	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
359	11-12389	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
383	11-13961	Dep.(mc); $7.00(OTS)
MonP		
442	11-14030	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
208	11-7887	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
272	11-9837	Dep.; $0.45(OTS)
386	11-12572	Dep.(mc); $0.25(OTS)
454	11-9838	Dep.; $0.45(OTS)
MonT		
155	11-7705	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
156(Del.)	11-12390	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
180	11-8684	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
205	11-7454	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
210	11-12391	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
253	11-12393	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
342	11-11712	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
348	11-7618	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MTA		
4(Rev.)	11-7879	Dep.; $0.30(OTS)
6	11-8722	Dep.(mc); 6.30(ph OTS); $3.00(mf OTS)
16(Rev.)	11-14019	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
30(Del.)	11-14020	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
42	11-13039	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43(Del.)	11-13962	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
48	11-13191	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
MTRL		
54-52	11-2693	See IDO-16266
54-60	11-13170	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-107	11-2445	See IDO-16308
119	11-12625	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
218	11-12573	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
231	11-12515	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MUC-ABG		
310	11-8522	See N-1779
MUC-FWHZ		
152	11-5285	See N-2128
MUC-GTS		
1118	11-5284	See N-1722
MURA (Misc.)		
126	11-3171	Dep.; $1.80(ph OTS); $1.80(mf OTS)
135	11-3172	Dep.; $3.30(ph OTS); $2.40(mf OTS)
137	11-3173	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
140	11-3174	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
201	11-716	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
203	11-1674	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
207	11-2993	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
212	11-3587	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
219	11-9149	Rev. Sci. Instr. 28, 403-20(1957)
249	11-6555	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
MURA (Misc.)		
254	11-6940	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
255	11-6941	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
258	11-7343	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
260	11-7344	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
261	11-7211	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
263	11-9498	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
273	11-9145	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
281	11-7345	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
295	11-9499	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
310	11-10136	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
311	11-9343	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
318	11-10767	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
319	11-10637	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
320	11-11456	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
321	11-12279	Dep.; $0.50(OTS)
329	11-10638	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
336	11-11457	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
339	11-11253	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
340	11-12134	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
361	11-13528	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
362	11-12917	Dep.; $4.80(ph OTS); $2.70(mf OTS)
MURA-DBL		
2	11-3173	See MURA-137
MURA/DBL/PS/KRS		
1	11-3171	See MURA-126
MURA-LJL		
10	11-3172	See MURA-135
MURA-LJL-Internal		
1	11-3172	See MURA-135
MURA-TO		
7	11-3174	See MURA-140
N (Misc.)		
1722	11-5284	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1779	11-8522	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1886	11-12518	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2128	11-5285	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2281	11-12574	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
NAA-AL		
345	11-12427	Dep.(mc); $0.25(OTS)
NAA-SR		
15	11-12980	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
28(Del.)	11-12981	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
34	11-13171	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
36	11-13700	Dep.(mc); $0.35(OTS)
41	11-7405	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
46	11-9839	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
47	11-13719	Dep.(mc); $0.35(OTS)
NAA-SR		
60(Del.)	11-13208	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
64	11-7904	Dep.; $0.35(OTS)
72	11-7711	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
73	11-8745	Dep.; $0.40(OTS)
76	11-11820	Dep.; $0.30(OTS)
81	11-10967	Dep.(mc); $0.25(OTS)
96	11-13963	Dep.(mc); $1.25(OTS)
103	11-2719	Dep.; $0.30(OTS)
104	11-1326	Dep.; $3.30(ph OTS); $2.40(mf OTS)
112	11-10968	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
113	11-10969	Dep.; $0.25(OTS)
114(Del.)	11-2300	Dep.; $0.20(OTS)
116(Del.)	11-4094	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
135	11-12975	Dep.(mc); $0.40(OTS)
137(Del.)	11-13964	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
138(Pt.2)	11-10970	Dep.; $0.35(OTS)
140	11-13172	Dep.(mc); $0.25(OTS)
142(Del.)	11-13196	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
146	11-13619	Dep.(mc); $0.35(OTS)
148	11-13173	Dep.(mc); $0.25(OTS)
153	11-9603	Dep.(mc); $0.30(OTS)
156	11-7880	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
160	11-8310	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
166(Del.)	11-14021	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
179(Rev.)	11-10985	Dep.(mc); $0.65(OTS)
194	11-13620	Dep.(mc); $0.35(OTS)
195(Del.)	11-13965	Dep.(mc); $45.00(ph OTS); $11.10(mf OTS)
197	11-2253	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
209	11-10972	Dep.; $0.25(OTS)
210	11-9840	Dep.; $0.25(OTS)
213	11-9637	Dep.(mc); $0.30(OTS)
214	11-9638	Dep.(mc); $0.25(OTS)
219(Del.)	11-13966	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
222	11-8311	Dep.; $0.40(OTS)
228	11-9768	Dep.; $0.30(OTS)
230	11-7842	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
231	11-7599	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
232	11-12982	Dep.(mc); $0.30(OTS)
237	11-7441	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
238	11-9841	Dep.; $0.40(OTS)
240	11-13967	Dep.(mc); $0.35(OTS)
242	11-7541	Dep.; $0.30(OTS)
243	11-9842	Dep.; $0.25(OTS)
245	11-8386	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
247	11-8312	Dep.; $0.40(OTS)
251	11-7693	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
255	11-8756	Dep.; $0.40(OTS)
258	11-9725	Dep.; $0.30(OTS)
259	11-7843	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
260	11-12575	Dep.(mc); $0.60(OTS)

Report	Abstract	Availability
NAA-SR		
273	11-8387	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
274	11-10988	Dep.(mc); $0.65(OTS)
282	11-8685	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
289	11-7844	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
836(Del.)	11-12626	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
844	11-8388	Dep.; $0.35(OTS)
852(Rev.)	11-12331	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
854	11-7845	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
878	11-8686	Dep.; $0.70(OTS)
895	11-12576	Dep.(mc); $0.75(OTS)
909	11-7888	Dep.; $0.40(OTS)
942	11-9894	Dep.; $0.35(OTS)
956	11-8687	Dep.; $0.65(OTS)
1013	11-9611	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1015	11-7542	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1027	11-8688	Dep.; $0.55(OTS)
1032	11-8389	Dep.; $0.35(OTS)
1033	11-8321	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1034	11-9843	Dep.(mc); $0.30(OTS)
1049	11-7846	Dep.; $0.65(OTS)
1062	11-8689	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1071	11-7543	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1079	11-8746	Dep.; $0.30(OTS)
1160	11-7544	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1237	11-8690	Dep.; $0.45(OTS)
1286	11-7889	Dep.; $0.40(OTS)
1289	11-7545	Dep.; $0.35(OTS)
1292	11-7847	Dep.; $0.60(OTS)
1333	11-8691	Dep.; $0.35(OTS)
1347(Del.)	11-13968	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
1374	11-9639	Dep.; $0.30(OTS)
1397	11-7546	Dep.; $0.40(OTS)
1432	11-12508	Dep.(mc); $0.30(OTS)
1435	11-7547	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1457	11-7848	Dep.; $0.65(OTS)
1476	11-7429	Dep.; $0.25(OTS)
1483	11-8692	Dep.; $0.50(OTS)
1513	11-13969	Dep.(mc); $0.80(OTS)
1515	11-7548	Dep.; $0.45(OTS)
1529	11-13680	Dep.; $0.35(OTS)
1568	11-10990	Dep.(mc); $0.35(OTS)
1626	11-7849	Dep.; $0.35(OTS)
1628	11-8390	Dep.; $0.45(OTS)
1634	11-9844	Dep.; $0.35(OTS)
1645	11-7921	Dep.; $0.40(OTS)
1654	11-4743	J. Appl. Phys. 28, 197-200(1957)
1659	11-1289	Dep.$0.20(OTS)
1676	11-7549	Dep.; $0.35(OTS)
1680	11-12487	Dep.(mc); $0.30(OTS)
1688	11-1128	Dep.; $0.20(OTS)
1700	11-6087	Dep.; $1.00(OTS)
1710	11-3756	Dep.; $0.30(OTS)
1716	11-3204	Dep.; $0.45(OTS)
1720	11-5780	Anal. Chem. Acta 17, 280-5(1957); Dep.; $0.20(OTS)
1724	11-7550	Dep.; $0.35(OTS)
1734	11-6294	Dep.; $0.20(OTS)
1735	11-6295	Dep.; $0.25(OTS)
1759	11-10829	Dep.(mc); $0.35(OTS)
1760	11-4095	Dep.; $0.40(OTS)
1761	11-5586	Dep.; $0.40(OTS)
1771	11-3682	Dep.; $0.20(OTS)
1782	11-4096	Dep.; $0.20(OTS)
1793	11-5260	Dep.; $0.20(OTS)
1796	11-3757	Dep.; $0.25(OTS)
1797	11-4812	Dep.; $0.25(OTS)
1804	11-5028	See TID-7525
1810	11-5025	Dep.; $0.25(OTS)
1811	11-5026	Dep.; $0.30(OTS)
1839	11-6770	Dep.; $0.35(OTS)
1846	11-5882	Dep.; $0.15(OTS)
1848	11-6257	Anal. Chem. 29, 1762-4(1957); Dep.; $0.15(OTS)
1855	11-5261	Dep.; $0.40(OTS)
1864	11-8174	Dep.; $0.20(OTS)
1867	11-9330	Dep.; $0.30(OTS)
1872	11-7144	Dep.; $0.25(OTS)
1873	11-12239	Dep.; $2.50(OTS)
1875	11-9478	Dep.; $0.35(OTS)
1885	11-8942	Dep.; $0.30(OTS)
1896	11-6088	Dep.; $0.20(OTS)
1920	11-11422	Dep.; $1.50(OTS)
1922	11-12702	Dep.; $0.30(OTS)
1925	11-12666	Dep.(mc); $0.45(OTS)
1926	11-9331	Dep.; $0.25(OTS)
1936	11-12895	Dep.; $1.50(OTS)
1938	11-12240	Dep.; $0.75(OTS)
1941	11-10736	Dep.(mc); $0.40(OTS)
1948	11-11423	Dep.; $0.30(OTS)
1949	11-10287	Dep.; $0.25(OTS)
1954	11-11424	Dep.; $0.25(OTS)
1963	11-10288	Dep.; $0.20(OTS)
1972	11-11316	Dep.; $0.20(OTS)
1989	11-12309	Dep.; $0.50(OTS)
2027	11-13503	Dep.; $1.50(OTS)
2047	11-13292	Dep.; $0.50(OTS)
NAA-SR-Memo		
20	11-9845	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
35	11-9769	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
38	11-8693	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
48	11-9846	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49	11-9847	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
NAA-SR-Memo		
51	11-2720	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56(Del.)	11-13113	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
58	11-8694	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
70	11-8547	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
72	11-9848	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
75	11-2511	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
78	11-2721	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
92	11-9849	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
93	11-7850	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
100	11-8695	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
113	11-12577	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
125	11-9640	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
129	11-8313	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
145	11-8696	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
153	11-8697	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
155	11-9850	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
174	11-12578	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
178	11-13970	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
181	11-8757	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
188	11-9851	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
191	11-8698	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
194	11-8699	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
203	11-9852	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
204(Del.)	11-13971	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
225	11-7851	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
228	11-7852	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
233	11-13174	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
236	11-10334	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
266	11-9853	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
277	11-8700	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
279	11-13972	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
306	11-13175	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
315(Del.)	11-13973	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
323	11-9854	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
324	11-13974	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
332	11-12579	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
344	11-12580	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
347	11-13975	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
351	11-9855	Dep.(mc); $1.80(ph OTS); $1 80(mf OTS)
385	11-8701	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
408(Del.)	11-2722	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
468	11-7853	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
488	11-10909	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
507	11-8702	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
530(Del.)	11-13176	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
617	11-13976	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
621	11-9856	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
631	11-2723	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
640	11-9857	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
669	11-8703	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
NAA-SR-Memo		
672	11-8704	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
702	11-8175	Dep.; $0.55(OTS)
716	11-13977	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
722	11-9902	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
724(Del.)	11-12581	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
758	11-1129	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
818	11-12582	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
850	11-6533	Dep.; $1.10(OTS)
1021	11-10289	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1069	11-11425	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1105	11-541	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1116	11-6898	Dep.; $0.15(OTS)
1269	11-3419	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1633	11-6086	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1639	11-10290	Dep.; $2.00(OTS)
NBL		
102	11-12347	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
118	11-12332	Dep.(mc); $0.30(OTS)
128	11-5781	Dep.; $0.20(OTS)
131	11-12348	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
133	11-1429	Dep.; $0.25(OTS)
134	11-6258	Dep.; $0.20(OTS)
135	11-10559	Dep.; $1.25(OTS)
NBS (Misc.)		
3124	11-12110	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3522	11-12743	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3535	11-12022	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3590	11-12019	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4555	11-3341	Dep.; $0.20(OTS)
4568	11-1835	Dep.; $0.15(OTS)
4616	11-2875	Dep.; $0.15(OTS)
4674	11-1789	Dep.; $0.25(OTS)
4708	11-4823	Dep.; $0.25(OTS)
4712	11-133	Dep.; $0.20(OTS)
4746	11-10431	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4877	11-4832	Dep.; $0.25(OTS)
4881	11-10432	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5009	11-12052	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
5044	11-11989	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5046	11-12305	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5100	11-10433	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5205	11-10434	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
NBS-C		
562(Suppl. 1)	11-11998	Dep.(mc); $0.25(GPO)
NBS-D (Misc.)		
103	11-3729	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
104	11-3730	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
107	11-3731	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
109	11-3732	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
111	11-3733	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
NBS-D (Misc.)		
123	11-7694	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
NBS-ID		
101	11-3728	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
NDA		
6	11-12444	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
8	11-12445	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
12-18	11-1268	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14-107	11-6089	Dep.; $0.40(OTS)
15C-61	11-2019	See NYO-6270
15C-87	11-1233	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
15-95	11-11460	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
22	11-5835	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
24	11-6705	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
26	11-1848	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
28	11-5836	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
30	11-1849	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
31(Del.)	11-13720	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
33	11-5837	Dep.; $4.80(ph OTS); $2.70(mf OTS)
2015-92	11-4543	Dep.; $0.20(OTS)
2015-93	11-5676	Dep.; $1.80(ph OTS); $1.80(mf OTS)
NDA-Memo		
15B-1	11-13857	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
NEA		
5401	11-9858	Dep.; $0.35(OTS)
NEVIS		
19	11-5494	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
22	11-4192	Phys. Rev. 105, 328-37(1957)
24	11-3001	Phys. Rev. 104, 1695-1702(1956)
25	11-3981	Phys. Rev. 105, 247-55(1957)
27	11-527	Phys. Rev. 103, 1827-36(1956)
31	11-6849	Phys. Rev. 106, 327-9(1957)
34	11-4972	Phys. Rev. 105, 1415-17(1957)
35	11-6016	Phys. Rev. 105, 1671-5(1957)
36	11-6981	Phys. Rev. 106, 340-5(1957)
40	11-8104	Phys. Rev. 106, 834-5(1957)
41	11-8105	Phys. Rev. 106, 835-7(1957)
43	11-9423	Phys. Rev. 106, 1108-10(1957)
46	11-10206	Nuovo cimento (10) 5, 1700-15(1957)
NLCO		
578	11-12333	Dep.(mc); $0.35(OTS)
608	11-3420	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
618	11-3421	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
624	11-12488	Dep.(mc); $0.30(OTS)
651	11-12334	Dep.(mc); $0.50(OTS)
671	11-9270	Dep.; $0.20(OTS)
675	11-9271	Dep.; $0.25(OTS)
682	11-10502	Dep.; $1.00(OTS)
NMI		
1118	11-12489	Dep.(mc); $0.40(OTS)
1121	11-13806	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1126	11-7683	Dep.; $0.75(OTS)
1128	11-8523	Dep.; $0.35(OTS)
1139	11-12490	Dep.(mc); $1.10(OTS)
1142	11-5339	Dep.; $0.20(OTS)
1145	11-7684	Dep.; $0.50(OTS)
1147	11-11237	Acta Met. 5, 465-72(1957)
1148	11-11710	Dep.; $0.25(OTS)
1161	11-5340	Dep.; $0.30(OTS)
1165	11-5886	Dep.; $0.20(OTS)
1168	11-6310	Dep.; $0.40(OTS)
1170	11-10560	Dep.; $3.75(OTS)
1171	11-7949	Dep.; $0.60(OTS)
1172	11-12288	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1176	11-9332	Dep.; $0.25(OTS)
1177	11-10090	Dep.; $1.25(OTS)
2028	11-12491	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2035	11-11711	Dep.; $0.15(OTS)
2036	11-8524	Dep.; $0.25(OTS)
NNSD		
4(Del.)	11-13978	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
9(Del.)	11-13979	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
15	11-13980	Dep.; $1.00(OTS)
NPG		
111	11-12583	Dep.(mc); $1.10(OTS)
NRF-BR		
65	11-13111	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
NRL		
4263	11-13098	See NYO-3788
4264	11-11009	See NYO-3789
4265	11-11010	See NYO-3790
NYO		
642	11-927	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
685 (Pts. I and II)	11-1462	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
889(Del.)	11-3717	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
1003	11-2278	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1025	11-2512	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
1026	11-2513	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1027	11-2514	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1028	11-2515	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1029	11-2516	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1082	11-7551	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1115	11-12492	Dep.(mc); $0.40(OTS)
1119	11-8525	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1129	11-7685	Dep.; $0.35(OTS)
1135	11-9691	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
NYO		
1140	11-1478	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1141	11-1479	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1142	11-1480	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1143	11-1481	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1144	11-1482	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1145	11-1812	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1146	11-1812	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1147	11-1814	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1148	11-1815	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1149	11-1483	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1150	11-9692	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1151	11-1816	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1152	11-1817	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1153	11-1818	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1154	11-1819	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1155	11-1820	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1156	11-1821	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1157	11-12394	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1158	11-1484	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1162	11-1485	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1163	11-1486	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1176	11-9641	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1185	11-12493	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1201	11-13095	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1235	11-9585	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1236	11-12335	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1240	11-12336	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1255	11-9586	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1265	11-13596	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1304	11-9693	Dep.; $0.25(OTS)
1305	11-9642	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1309	11-13055	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1320	11-8281	Dep.; $0.25(OTS)
1321	11-7586	Dep.; $0.25(OTS)
1327	11-8526	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1328	11-8527	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1329	11-9694	Dep.; $0.25(OTS)
1335	11-7587	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1337	11-9643	Dep.; $0.35(OTS)
1346	11-8528	Dep.; $0.25(OTS)
1347	11-9644	Dep.; $0.25(OTS)
1450	11-2353	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1451	11-2354	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1464	11-9645	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1466	11-13701	Dep.(mc); $0.35(OTS)
1467	11-9646	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1580	11-7595	Dep.; $0.45(OTS)
2017	11-2398	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2029	11-9596	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2040	11-10854	Dep.(mc); $0.55(OTS)
2048(Del.)	11-10830	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
NYO		
2065	11-9947	Dep.; $0.20(OTS)
2077	11-11929	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2092	11-11842	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2094	11-12817	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3109	11-7932	Dep.; $0.25(OTS)
3154	11-6707	Chem. Eng. Progr. 52, Symposium Ser.
3363	11-7190	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3434	11-1749	Dep.; $0.25(OTS)
3435	11-7942	Dep.; $0.45(OTS)
3500	11-3846	Welding J. (N. Y.) 36, 442S-8S(1957);
3561	11-2863	Anal. Chem. 29, 38-45(1957)
3575	11-11713	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3578	11-11714	Dep.; $0.40(OTS)
3680	11-7686	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3724	11-5391	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3726	11-7687	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3728	11-13096	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3730	11-13097	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3750	11-12036	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3788	11-13098	Dep.(mc); $0.25(OTS)
3789	11-11009	Dep.; $0.25(OTS)
3790	11-11010	Dep.; $0.25(OTS)
3793	11-12428	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3794	11-2399	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3796	11-13702	Dep.; $0.25(OTS)
3797	11-9745	Dep.; $0.25(OTS)
3798	11-12349	Dep.(mc); $0.30(OTS)
3800	11-12429	Dep.(mc); $0.40(OTS)
3864	11-4113	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3890	11-4005	J. Am. Chem. Soc. 78, 5486-90(1956)
3898	11-2821	J. Am. Chem. Soc. 78, 3553-7(1956)
3923	11-10915	Dep.; $0.25(OTS)
3924	11-9859	Dep.(mc); $0.50(OTS)
3976	11-4825	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4003	11-2413	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4440	11-1841	Dep.; $0.60(OTS)
4441	11-1402	Dep.; $0.50(OTS)
4478	11-8763	Dep.; $0.55(OTS)
4610	11-6322	Dep.; $0.40(OTS)
4611	11-3886	Dep.; $0.40(OTS)
4612	11-10123	Dep.; $1.50(OTS)
4617	11-928	Dep.; $7.80(ph OTS); $3.30(mf OTS)
4656	11-878	Dep.(mc); $0.30(OTS)
4664	11-1244	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4698	11-3479	Dep.; $1.00(OTS)
4702	11-6656	Dep.; $0.20(OTS)
4708	11-1263	Dep.(mc.); $4.80(ph OTS); $2.70(mf OTS)
4712	11-50	Dep.; $0.30(OTS)
4714	11-9203	Dep.; $0.15(OTS)
4715	11-5471	Nuovo cimento (10) 5, 216-19(1957)
4716	11-5993	Phys. Rev. 105, 1925-7(1957)

Report	Abstract	Availability
NYO		
4751	11-3480	Dep.; $0.30(OTS)
4751(Rev.)	11-4795	Dep.; $0.30(OTS)
4752	11-8037	Dep.; $0.20(OTS)
4753	11-51	Dep.; $0.35(OTS)
4759	11-9988	Acta Chem. Scand. 10, 1520-6(1956)
4840	11-8129	Phys. Rev. 106, 832-4(1957)
4841	11-12206	Nuclear Phys. 4, 282-6(1957)
4842	11-12819	Nuovo cimento (10) 6, 311-18(1957)
4849	11-12241	Dep.; $3.25(OTS)
4859	11-9508	Dep.; $1.00(OTS)
4861	11-6211	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4869	11-6741	Dep.; $0.20(OTS)
4930	11-3653	Cancer Research 17, 34-7(1957)
4931	11-3654	Cancer Research 17, 38-42(1957)
4932	11-3655	Cancer Research 17, 43-7(1957)
5000	11-9695	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5026	11-9597	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5027	11-9696	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5045	11-12430	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5046	11-12431	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5047	11-12432	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5049	11-12395	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5054(Del.)	11-13040	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5055(Del.)	11-13703	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5056(Del.)	11-13041	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5061	11-12350	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5071	11-13681	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5084	11-12396	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5096	11-10855	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5101	11-12972	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5102	11-9746	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5106	11-9697	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5108	11-9647	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5113	11-9648	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
5114	11-10831	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5115	11-10832	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5117	11-8529	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5126	11-10856	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5127	11-9698	Dep.; $0.30(OTS)
5135	11-9649	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5147	11-12969	Dep.(mc); $0.25(OTS)
5156	11-9650	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
5165	11-10834	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5168	11-9651	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5169	11-10835	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5172	11-12397	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5182	11-2400	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5185	11-2401	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5189	11-12433	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5190	11-13016	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5196	11-9652	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
5223	11-12351	Dep.(mc); $0.30(OTS)
5224	11-13222	Dep.(mc); $0.35(OTS)
5228	11-9699	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5250	11-12337	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5258	11-12338	Dep.(mc); $0.25(OTS)
6084	11-1487	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
6099	11-9258	A.I.Ch.E. Journal 3, 157-61(1957)
6227	11-706	Phys. Rev. 104, 202-4(1956)
6242	11-1229	Dep.; $0.65(OTS)
6270	11-2019	Dep.; $0.40(OTS)
6330	11-2920	Dep.; $0.15(OTS)
6332	11-3423	Dep.; $0.10(OTS)
6333	11-5370	Dep.; $0.15(OTS)
6334	11-4462	Dep.; $0.15(OTS)
6339	11-6493	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
6484	11-1234	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
6498	11-11123	Dep.; $3.75(OTS)
6507	11-10442	Dep.; $3.50(OTS)
6520	11-1828	A.I.Ch.E. Journal 2, 468-70(1956)
6593	11-4301	Anal. Chim. Acta 16, 101-8(1957)
6621	11-3424	Dep.; $0.15(OTS)
6623	11-3441	Dep.; $0.15(OTS)
6630	11-7312	Can J. Phys. 35, 649-55(1957)
6634	11-12037	Dep.; $3.50(OTS)
6636	11-4927	Phys. Rev. 105, 1285-7(1957)
6676	11-9986	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7008	11-6235	Dep.; $0.25(OTS)
7009	11-6236	Dep.; $0.30(OTS)
7056	11-1130	Acta Met. 5, 65-73(1957) Feb.; Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7079	11-12093	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7115	11-4597	Phys. Rev. 105, 724-8(1957)
7151	11-3881	Proc. Phys. Soc. (London) B69, 808-13 (1956)
7179	11-3784	Dep.; $0.45(OTS)
7181	11-1007	Record Chem. Progr. Kresge-Hooker Sci. Lib. 17 No. 3, 125-43(1956)
7183	11-13276	Anal. Chem. 29, 1531-4(1957)
7234	11-2820	J. Am. Chem. Soc. 78, 2667-70(1956)
7257	11-5342	Dep.; $0.30(OTS)
7292	11-762	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7302	11-5384	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7313	11-5409	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
7314	11-4527	Phys. Rev. 106, 1146-50(1957); Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7315	11-12098	Dep.; $1.75(OTS)
7346	11-10017	J. Chem. Phys. 27, 1-10(1957)
7369	11-10438	J. Am. Chem. Soc. 79, 3664-7(1957)

Report	Abstract	Availability
NYO		
7381	ii-10782	Phys. Rev. 107, 41-3(1957)
7385	ii-788	J. Opt. Soc. Amer. 46, 885-9(1956)
7397	ii-1181	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7403	ii-2815	Dep.; $0.25(OTS)
7459	ii-4713	Phys. Rev. 105, 713-7(1957)
7460	ii-3045	Phys. Rev. 104, 1411-23(1956)
7461	ii-6056	Phys. Rev. 105, 1563-9(1957)
7463	ii-131	J. Inorg. and Nuclear Chem. 2, 141-8(1956)
7464	ii-89	J. Am. Chem. Soc. 78, 900(1956)
7466	ii-737	J. Chem. Phys. 25, 617-19(1956)
7467	ii-738	J. Chem. Phys. 25, 619-23(1956)
7484	ii-360	J. Appl. Phys. 27, 1186-8(1956)
7498	ii-11107	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7532	ii-4643	Phys. Rev. 105, 652-7(1957)
7533	ii-10766	Phys. Rev. 107, 219-22(1957)
7543	ii-4394	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7544	ii-5286	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7545	ii-12121	Rev. Sci. Instr. 28, 342-4(1957)
7553	ii-954	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
7596	ii-1964	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7617	ii-1453	J. Am. Chem. Soc. 78, 6008-13(1956)
7623	ii-3596	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7635	ii-3047	Phys. Rev. 104, 1444-5(1956)
7637	ii-702	Phys. Rev. 104, 118-23(1956)
7652	ii-3425	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7670	ii-5687	Phys. Rev. 105, 1068-74(1957)
7672	ii-1301	Phys. Rev. 104, 449-56(1956)
7673	ii-3887	Nature 178, 688-9(1956)
7674	ii-534	Phys. Rev. 104, 267-9(1956)
7677	ii-3984	Phys. Rev. 105, 278-84(1957)
7690	ii-479	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
7692	ii-1235	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7693	ii-12758	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7694	ii-4563	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7695	ii-5429	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
7696	ii-5430	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7698	ii-11317	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7699	ii-4861	Dep.; $0.30(OTS)
7705	ii-6237	Dep.; $0.30(OTS)
7715	ii-9213	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7735	ii-7346	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7747	ii-9040	Progr. Theoret. Phys. (Japan) 17, 288-302 (1957)
7750	ii-8951	Phys. Rev. 106, 321-6(1957)
7751	ii-10240	Phys. Rev. 106, 1246-8(1957)
7782	ii-185	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7783	ii-1822	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7784	ii-4363	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7786	ii-2921	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7787	ii-2922	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7789	ii-5889	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7795	ii-6669	J. Chem. Phys. 26, 846-50(1957)
7816	ii-1675	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7818	ii-4144	Phys. Rev. 106, 564-8(1957); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7819	ii-9416	Phys. Rev. 106, 1049-50(1957)
7821	ii-11306	Annals of Physics 2, 166-75(1957)
7824	ii-6852	Phys. Rev. 106, 599-601(1957)
7826	ii-7358	Dep.; $0.15(OTS)
7860	ii-9493	Phys. Rev. 106, 965-71(1957)
7886	ii-7374	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
7887	ii-5392	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7895	ii-6535	Dep.; $0.30(OTS)
7896	ii-12099	Dep.; $1.25(OTS)
7897	ii-11285	Dep.; $1.25(OTS)
7898	ii-11286	Dep.; $0.75(OTS)
7916	ii-7197	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7917	ii-8943	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7918	ii-10111	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7936	ii-9256	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
7957	ii-4993	Phys. Rev. 105, 1311-23(1957)
7959	ii-10711	Phys. Rev. 107, 326-7(1957)
7960	ii-11379	Phys. Rev. 107, 633-4(1957)
7967	ii-6420	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
8000	ii-3764	J. Phys. Chem. 61, 69-74(1957)
8001	ii-3765	J. Phys. Chem. 61, 75-81(1957)
8006	ii-3470	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
8013	ii-6142	Phys. Rev. 105, 1788-95(1957)
8015	ii-12783	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
8021	ii-11059	Dep.; $3.30(ph OTS); $2.40(mf OTS)
8500	ii-11428	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
8501	ii-10165	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
8527	ii-10073	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
ORNL		
20	ii-9653	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
50	ii-7854	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
115	ii-9890	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
122	ii-9654	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
130	ii-9612	Dep.; $0.45(OTS)
153	ii-9598	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
156	ii-11669	Dep.(mc); $1.10(OTS)
170	ii-7855	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
195	ii-8459	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
209	ii-13219	Dep.(mc); $0.35(OTS)
216	ii-12494	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
238	ii-12398	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
258	ii-12399	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
260(Del.)	ii-9655	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
267	ii-8705	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)

Report	Abstract	Availability
ORNL		
286(Del.)	11-8282	Dep.(mc); $33.30(ph OTS); $9.60(mf OTS)
287	11-7552	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
298	11-8460	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
302	11-9656	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
307	11-8314	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
315	11-11684	Dep.(mc); $0.45(OTS)
323(Pt. 1)	11-13597	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
323(Pt. 2)	11-13017	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
336	11-7430	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
371	11-8391	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
372	11-7553	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
374	11-8392	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
402	11-9860	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
424	11-8750	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
527(Del.)	11-13177	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
532	11-963	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
543	11-9657	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
551	11-10898	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
564(Del.)	11-9658	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
576	11-8548	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
607	11-12339	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
620	11-9659	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
625	11-12400	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
642	11-7688	Dep.; $0.40(OTS)
647	11-2279	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
651	11-7554	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
681	11-3399	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
724	11-7596	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
730	11-9861	Dep.; $0.55(OTS)
731	11-13981	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
743(Del.)	11-12401	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
747	11-2280	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
766	11-8530	Dep.; $0.30(OTS)
795	11-8283	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
801	11-9660	Dep.(mc); $0.25(OTS)
864(Del.)	11-14031	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
874	11-7555	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
890	11-8393	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
932	11-3779	Dep.; $4.80(ph OTS); $2.70(mf OTS)
942	11-7619	Dep.; $0.60(OTS)
947	11-7620	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
951	11-9862	Dep.(mc); $0.40(OTS)
967	11-13178	Dep.(mc); $0.25(OTS)
990	11-11801	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
1053	11-12970	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
1057	11-9863	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
1062	11-13179	Dep.(mc); $0.45(OTS)
1066	11-7621	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1075	11-9864	Dep.; $0.25(OTS)
1090	11-12495	Dep.(mc); $0.60(OTS)
1094	11-13180	Dep.(mc); $0.55(OTS)
1095	11-8747	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
ORNL		
1116	11-11574	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
1121(Rev.)	11-8706	Dep.; $1.10(OTS)
1130	11-9777	Dep.; $0.25(OTS)
1133(Pt. 2 (Del.))	11-14036	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1137	11-7856	Dep.; $0.40(OTS)
1138	11-9561	Dep.(mc); $0.30(OTS)
1148	11-7556	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1171	11-13181	Dep.(mc); $0.35(OTS)
1221	11-12584	Dep.(mc); $25.80(ph OTS); $7.80(mf OTS)
1224	11-7557	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1242(Del.)	11-13018	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1268	11-9763	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1280	11-7857	Dep.; $1.35(OTS)
1290(Del.)	11-13851	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1314	11-9662	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1318	11-12585	Dep.(mc); $27.30(ph OTS); $8.10(mf OTS)
1322	11-3460	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
1338	11-9663	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1345(Del.)	11-13836	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1364	11-8394	Dep.; $0.30(OTS)
1367(Rev.)	11-8395	Dep.; $0.85(OTS)
1368(Del.)	11-2724	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1371	11-13209	Dep.(mc); $0.40(OTS)
1384	11-11647	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
1387	11-2232	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1432	11-8284	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
1446	11-2355	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1458	11-8574	Dep.; $0.25(OTS)
1463	11-13182	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1467	11-8300	Dep.; $0.30(OTS)
1478(Del.)	11-13982	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
1480	11-2356	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1518	11-8396	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
1554	11-8707	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
1567(Del.)	11-2725	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1610(Rev.)	11-13019	Dep.(mc); $0.60(OTS)
1633(Del.)	11-7689	Dep.; $0.25(OTS)
1634	11-13183	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1647	11-9747	Dep.; $0.50(OTS)
1658	11-7858	Dep.; $0.80(OTS)
1663	11-13114	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1674	11-9587	Dep.(mc); $0.70(OTS)
1678	11-8708	Dep.; $0.70(OTS)
1690	11-7558	Dep.; $0.45(OTS)
1706	11-9664	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1711	11-10973	Dep.; $0.25(OTS)
1717(Rev.)	11-8285	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1726	11-9865	Dep.; $0.30(OTS)

Report	Abstract	Availability
ORNL		
1746	11-10974	Dep.(mc); $0.30(OTS)
1751	11-8561	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1761	11-9866	Dep.; $0.50(OTS)
1780(Del.)	11-13984	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1784	11-8397	Dep.; $0.35(OTS)
1788(Rev.)	11-11586	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1794(Vol. 1)	11-9867	Dep.; $0.55(OTS)
1796	11-2122	Dep.(mc); $13.80(ph OTS); $4.80(ph OTS)
1810	11-12586	Dep.; $0.50(OTS)
1812	11-11648	Dep.; $0.35(OTS)
1813(Del.)	11-13985	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
1817	11-1373	Dep.; $0.50(OTS)
1836	11-9868	Dep.; $0.35(OTS)
1853	11-7859	Dep.; $1.35(OTS)
1855	11-8398	Dep.; $0.35(OTS)
1858	11-6091	Dep.; $0.60(OTS)
1866	11-1327	Dep.; $0.25(OTS)
1874	11-8557	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1880(Rev.)	11-8296	Dep.; $0.50(OTS)
1887	11-8297	Dep.; $0.30(OTS)
1895	11-9869	Dep.(mc); $1.10(OTS)
1903	11-2357	Dep.; $0.75(OTS)
1904	11-11802	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1914(Del).	11-2858	Dep.; $0.35(OTS)
1931	11-9588	Dep.; $0.30(OTS)
1938	11-9891	Dep.; $0.35(OTS)
1940	11-8286	Dep.; $0.60(OTS)
1954	11-9599	Dep.(mc); $0.25(OTS)
1959	11-214	Dep.; $0.50(OTS)
1970(Del.)	11-186	Dep.; $0.25(OTS)
1973	11-12973	Dep.(mc); $0.40(OTS)
1979	11-9665	Dep.; $0.40(OTS)
1982	11-11558	Dep.; $0.45(OTS)
1986	11-12974	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1991	11-8531	Dep.; $0.30(OTS)
2002	11-3759	Dep.; $0.30(OTS)
2003	11-9600	Dep.; $0.40(OTS)
2009	11-3217	Dep.; $0.15(OTS)
2011	11-9901	Dep.; $0.40(OTS)
2014	11-11575	Dep.; $0.35(OTS)
2020	11-13020	Dep.(mc); $0.30(OTS)
2021	11-13184	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2036	11-12587	Dep.(mc); $0.25(OTS)
2038	11-1794	Dep.(mc); $0.30(OTS)
2041	11-8287	Dep.; $0.25(OTS)
2042	11-11803	Dep.; $0.40(OTS)
2043	11-13704	Dep.(mc); $0.50(OTS)
2046	11-11576	Dep.(mc); $0.60(OTS)
2069	11-11577	Dep.; $1.25(OTS)
2071	11-7860	Dep.; $0.40(OTS)
2078(Del.)	11-12456	Dep.(mc); $0.65(OTS)
ORNL		
2081	11-1618	Dep.; $1.25(OTS)
2089	11-12588	Dep.(mc); $0.30(OTS)
2096	11-7861	Dep.; $1.10(OTS)
2097	11-12513	Dep.(mc); $0.40(OTS)
2100	11-552	Dep.; $0.20(OTS)
2102	11-12314	Dep.(mc); $0.55(OTS)
2110	11-4847	Dep.; $0.20(OTS)
2118	11-4004	Dep.; $0.30(OTS)
2126	11-4213	Dep.; $0.40(OTS)
2127(Pt. 1 (Vols. 1 & 2))	11-11491	Dep.; $7.00(OTS)
2128	11-13986	Dep.; $0.50(OTS)
2138	11-1227	Dep.; $0.25(OTS)
2151	11-52	Dep.; $0.55(OTS)
2158	11-7264	Dep.; $0.55(OTS)
2161	11-1430	Dep.; $4.80(ph OTS); $2.70(mf OTS)
2164	11-653	Dep.; $0.30(OTS)
2165	11-7862	Dep.; $0.45(OTS)
2171	11-8288	Dep.; $0.25(OTS)
2172	11-3361	Dep.; $0.65(OTS)
2173	11-3362	Dep.; $0.30(OTS)
2174	11-1374	Dep.; $0.30(OTS)
2175	11-1059	Dep.; $0.30(OTS)
2177	11-4931	Dep.; $0.30(OTS)
2178	11-929	Dep.; $0.20(OTS)
2179	11-5591	Dep.; $0.25(OTS)
2181	11-318	Dep.; $0.30(OTS)
2188	11-1922	Dep.; $0.65(OTS)
2192	11-1202	Dep.; $0.45(OTS)
2194	11-4181	Dep.; $0.25(OTS)
2196	11-12285	Dep.; $0.75(OTS)
2204	11-4016	Dep.; $0.50(OTS)
2207	11-2936	Dep.; $0.35(OTS)
2208	11-1799	Dep.; $0.35(OTS)
2209	11-10836	Dep.(mc); $0.30(OTS)
2210(Del.)	11-13682	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2211	11-3700	Dep.; $0.20(OTS)
2212	11-2859	Dep.; $0.15(OTS)
2213	11-2860	Dep.; $0.20(OTS)
2214	11-1823	Dep.; $0.20(OTS)
2215	11-1824	Dep.; $0.15(OTS)
2222	11-4692	Dep.; $1.00(OTS)
2224(Vol. 1)	11-2162	Dep.; $0.50(OTS)
2224(Vol. 2)	11-4182	Dep.; $0.50(OTS)
2225	11-11429	Dep.; $1.25(OTS)
2226	11-1776	Dep.; $0.45(OTS)
2227	11-9666	Dep.; $0.25(OTS)
2230	11-2972	Dep.; $0.30(OTS)
2234	11-4544	Dep.; $0.25(OTS)
2236	11-3935	Dep.; $0.40(OTS)

Report	Abstract	Availability
ORNL		
2238	11-4327	Dep.; $1.80(ph OTS); $1.80(mf OTS)
2240	11-4098	Dep.; $0.40(OTS)
2241	11-2973	Dep.; $0.40(OTS)
2242	11-10474	Dep.; $1.00(OTS)
2245	11-5262	Dep.; $0.20(OTS)
2252	11-7134	Dep.; $0.20(OTS)
2253	11-5847	Non-Destructive Testing 15, 104-9(1957)
2254	11-8902	Non-Destructive Testing 15, 140-4(1957)
2256	11-6907	Dep.; $0.35(OTS)
2268	11-7090	Dep.; $0.20(OTS)
2269	11-8869	Dep.; $0.25(OTS)
2272	11-6536	Dep.; $1.10(OTS)
2275	11-9378	Dep.; $0.25(OTS)
2276	11-6557	Dep.; $0.20(OTS)
2277	11-7286	Dep.; $0.65(OTS)
2280	11-6386	Dep.; $0.15(OTS)
2283	11-9387	Dep.; $0.30(OTS)
2284	11-6720	Dep.; $0.30(OTS)
2287	11-7130	Dep.; $0.20(OTS)
2289	11-8981	Dep.; $0.10(OTS)
2291	11-9214	Dep.; $0.25(OTS)
2294	11-7166	Nuclear Sci. and Eng. 2, 640-56(1957); Dep.; $0.30(OTS)
2296	11-7198	Dep.; $0.20(OTS)
2297	11-7969	Dep.; $0.30(OTS)
2298	11-6818	Dep.; $0.35(OTS)
2302	11-9189	Dep.; $0.40(OTS)
2303	11-9987	Dep.; $0.20(OTS)
2304	11-8815	Dep.; $0.40(OTS)
2306	11-10475	Dep.; $0.25(OTS)
2308	11-9257	Dep.; $0.25(OTS)
2309	11-10229	Dep.; $1.00(OTS)
2311	11-9479	Dep.; $1.00(OTS)
2312	11-13340	Dep.; $0.75(OTS)
2315	11-10622	Dep.; $0.20(OTS)
2320	11-11492	Dep.; $2.50(OTS)
2321	11-8870	Dep.; $0.20(OTS)
2323	11-7933	Dep.; $0.55(OTS)
2325	11-11293	Dep.; $0.50(OTS)
2326	11-10476	Dep.; $0.30(OTS)
2327	11-10435	Dep.; $0.50(OTS)
2328	11-10563	Dep.; $3.25(OTS)
2329	11-13504	Dep.; $1.25(OTS)
2331	11-12898	Dep.; $5.00(OTS)
2332	11-12703	Dep.; $0.75(OTS)
2334	11-8992	Dep.; $0.40(OTS)
2339	11-10477	Dep.; $0.50(OTS)
2344	11-12055	Dep.; $1.50(OTS)
2345	11-11257	Dep.; $1.00(OTS)
2346	11-10036	Dep.; $0.25(OTS)
2352	11-12931	Dep.; $1.50(OTS)
2358	11-10688	Dep.; $1.25(OTS)

Report	Abstract	Availability
ORO		
158	11-3028	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
159	11-3179	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
160	11-5134	Dep.; $0.40(OTS)
161	11-3329	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
162	11-8191	Dep.; $0.20(OTS)
163	11-11021	Dep.; $2.25(OTS)
164	11-10623	Dep.; $1.50(OTS)
165	11-7112	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
168	11-11022	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
ORO-T		
357	11-8764	Biological Effects of Whole-body Gamma Radiation on Human Beings. Harold O. Davidson. Baltimore, The Johns Hopkins Press, 1957. 101p.
P (Misc.)		
804	11-2517	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
810	11-2518	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
811	11-2519	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
812	11-2520	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
813	11-2521	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
814	11-2290	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
816	11-2522	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
822-AEC	11-9956	J. Meteorol. 14, No. 1, 1-8(1957)
881-AEC	11-3643	See AECU-3403
882-AEC	11-3644	See AECU-3405
883-AEC	11-9957	J. Meteorol. 14, No. 2, 115-25(1957)
996	11-9050	Proc. Natl. Acad. Sci. U. S. 43, 517-20 (1957)
P-F		
13	11-13957	See LWS-22710
PM-S		
23	11-5409	See NYO-7313
25	11-12098	See NYO-7315
25(App.)	11-12099	See NYO-7896
27	11-11285	See NYO-7897
28	11-11286	See NYO-7898
PNJ-LA		
1	11-231	See AECU-3274
6	11-232	See AECU-3279
9	11-233	See AECU-3282
11	11-234	See AECU-3284
PPC		
2	11-2432	See IDO-16311
47	11-2694	See IDO-16267
75	11-2758	See IDO-16270
103	11-3910	See IDO-16306
142	11-2624	See IDO-16275
150	11-2625	See IDO-16277

Report	Abstract	Availability
PPC		
189(Del.)	11-13002	See IDO-14376(Del.)
219	11-2507	See IDO-16281
PS-AP		
292489	11-11804	See TID-5341
292494	11-1073	See AECU-3260
PTR		
10	11-2344	See IDO-16273
21	11-12649	See AECU-3176
36	11-13725	See IDO-16344
49	11-13923	See IDO-16347
62	11-13924	See IDO-16350
67	11-13925	See IDO-16351
81	11-13142	See IDO-16353
83	11-13926	See IDO-16354
86	11-12373	See IDO-14408
93(Rev.)	11-10730	See IDO-16325
98	11-13927	See IDO-16357
102(Rev.)	11-10731	See IDO-16326
110	11-13143	See IDO-16359
111	11-13830	See IDO-16360
118	11-13144	See IDO-16363
119	11-13207	See IDO-16364
123	11-13145	See IDO-16365
146	11-13146	See IDO-16367
PWAC		
158	11-1882	Dep.(mc); $4.80(ph OTS); 2.70(mf OTS)
167	11-7179	Dep.(mc); $0.25(OTS)
R (Misc.)		
52GL85	11-451	See AECU-3114
52GL166	11-2611	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
55GL1	11-452	See AECU-3172
251-AEC (Amended)	11-8789	See AECU-3488
5453	11-2525	See SEP-57
RD		
346(Del.)	11-13916	See COO-208(Del.)
RIB		
12	11-1245	Dep.; $0.20(OTS)
14	11-1246	Dep.; $0.20(OTS)
16	11-5410	Dep.; $0.35(OTS)
17	11-1247	Dep.; $0.20(OTS)
19	11-1965	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
20	11-11301	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
23	11-11302	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
RL		
4.6.23	11-2402	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4.6.49	11-2281	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4.6.315	11-2358	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4.6.930	11-2403	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
8.6.5	11-3797	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
RM (Misc.)		
1237-AEC	11-5427	See AECU-3259
1779-AEC	11-793	See AECU-3365
1793-AEC	11-549	See AECU-3366
1823(AEC)	11-3459	See AECU-3376
1865-AEC	11-6771	See AECU-3461
RME		
74	11-1084	Econ. Geol. 51, 632-48(1956)
81(Rev.)	11-10083	Dep.; $0.25(OTS)
1055(Rev.)	11-4433	Dep.; $0.20(OTS)
1062(Rev.)	11-4434	Dep.; $0.20(OTS)
1066(Rev.)	11-12734	Dep.; $0.50(OTS)
1073(Rev.)	11-11191	Dep.; $0.15(OTS)
1074	11-4862	Dep.; $0.25(OTS)
1076	11-1082	Dep. $0.15(OTS)
2025(Rev.)	11-4435	Dep.; $0.15(OTS)
2029	11-6354	Dep.; $0.20(OTS)
2030(Rev.)	11-10539	Dep.; $0.75(OTS)
2035(Rev.)	11-6355	Dep.; $0.55(OTS)
2039(Pt. 1)	11-3402	Dep.; $0.20(OTS)
2045	11-7191	Dep.; $0.30(OTS)
2048(Rev.)	11-4863	Dep.; $0.20(OTS)
2052	11-3403	Dep.; $0.15(OTS)
3114	11-4436	Dep.; $0.25(OTS)
3115	11-3404	Dep.; $0.25(OTS)
3117	11-3820	Dep.; $0.25(OTS)
3118	11-5315	Dep.; $0.25(OTS)
3126	11-4864	Dep.; $0.35(OTS)
3128	11-5316	Dep.; $0.30(OTS)
3129	11-4865	Dep.; $0.30(OTS)
3130	11-3821	Dep.; $0.25(OTS)
3131	11-4437	Dep.; $0.25(OTS)
3132	11-3822	Dep.; $0.20(OTS)
3133	11-4438	Dep.; $0.20(OTS)
3134	11-4866	Dep.; $0.25(OTS)
3135	11-3823	Dep.; $0.25(OTS)
3136	11-3824	Dep.(mc); $0.25(OTS)
3137(Pt. 2)	11-5317	Dep.; $0.25(OTS)
3139	11-4439	Dep.; $0.25(OTS)
3140	11-3825	Dep.; $0.30(OTS)
3141	11-3405	Dep.; $0.40(OTS)
3142	11-4440	Dep.; $0.25(OTS)
3145	11-6356	Dep.; $0.20(OTS)
3147	11-8913	Dep.; $0.20(OTS)
3149	11-12704	Dep.; $0.75(OTS)
4073	11-4288	Dep.; $0.15(OTS)
RMO		
2035	11-988	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2043	11-930	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2044	11-5263	Dep.; $0.50(OTS)
2045(Del.)	11-10037	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2618	11-989	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)

Report	Abstract	Availability
RMO		
2619	11-990	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2620	11-1020	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2621	11-1021	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2622	11-6683	Dep.; $0.45(OTS)
2623	11-991	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2652	11-7970	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2801	11-8871	Dep.; $0.60(OTS)
2802	11-10478	Dep.; $4.50(OTS)
2803	11-7192	Dep.; $0.40(OTS)
2804	11-10479	Dep.; $1.25(OTS)
2805	11-7971	Dep.; $0.45(OTS)
2850	11-2861	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2938	11-4364	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3000	11-5306	Dep.; $0.25(OTS)
4005 (Pts. A and B)	11-3760	(Pt. A). Dep.(mc); $18.30(ph OTS); $6.00 (mf OTS) (Pt. B). Dep.(mc); $30.30(ph OTS); $8.70 (mf OTS)
4010	11-7145	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
RR		
43.1	11-176	See AECU-3181
46.1	11-1809	See AECU-3367
SIC/MD		
56-102	11-13889	See CERD-SIC-106
SC		
1795(TR)	11-2523	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1851(TR)(Del.)	11-2365	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2076(TR)	11-2577	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2700A(TR)	11-2615	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2991(TR)	11-6460	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3305(TR)	11-2578	Dep.; $0.35(OTS)
3725(M)	11-2524	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3831(TR)	11-6461	Dep.; $0.65(OTS)
3896(TR)	11-6462	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
4036(TR)	11-10112	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4046(M)	11-6959	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4073	11-6213	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4074(TR)	11-11839	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
SCDC		
632	11-10107	See AECU-3507
665	11-12111	Dep.; $0.50(OTS)
666	11-10616	Dep.; $0.40(OTS)
SCL-T		
123	11-12100	Dep.(mc); JCL
132	11-12142	Dep.(mc); JCL
133	11-12301	Dep.(mc); JCL
135	11-12114	Dep.(mc); JCL
136	11-12115	Dep.(mc); JCL
138	11-12013	Dep.(mc); JCL
SCL-T		
139	11-12759	Dep.(mc); JCL
141	11-12095	Dep.(mc); JCL
143	11-111264	Dep.(mc); JCL
147	11-12116	Dep.(mc); JCL
SCTM		
92-57(14)	11-13380	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
173-57(14)	11-12805	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
183-57(14)	11-12071	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
205-57(16) (Del.)	11-13360	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
220-56-(51)	11-10587	Dep.; $0.70(OTS)
SE-PC		
45	11-9622	See CN-3274
SEP (Misc.)		
14	11-12496	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18	11-8532	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
39	11-12497	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49	11-12589	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57	11-2525	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
88	11-12498	Dep.(mc); $0.40(OTS)
107	11-12499	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
110	11-12434	Dep.(mc); $0.35(OTS)
140	11-9748	Dep.; $0.25(OTS)
146	11-9749	Dep.; $0.40(OTS)
170(Del.)	11-12448	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
171	11-12435	Dep.(mc); $0.25(OTS)
179	11-13807	Dep.(mc); $0.20(OTS)
208	11-4886	Dep.; $0.25(OTS)
209	11-4887	Dep.; $0.25(OTS)
213	11-4463	J. Metals 9, 87-94(1957); Dep.; $0.30(OTS)
214	11-12402	Dep.(mc); $0.30(OTS)
216	11-11011	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
227	11-6389	Dep.; $0.30(OTS)
229	11-6390	Dep.; $0.20(OTS)
SO		
2049	11-3426	Phys. and Chem. of Solids 2, 327-38(1957); Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2050	11-3427	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2051	11-10564	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2525	11-1524	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2526	11-1132	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3000	11-12500	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3006	11-2526	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3258	11-9247	J. Chem. Phys. 26, 1727-33(1957)
SOA		
159	11-1487	See NYO-6084
SOD		
13	11-12403	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
17	11-13683	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)

Report	Abstract	Availability
SPL		
51:28	11-2895	See TID-5068
STR-IR		
39	11-12516	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
SUI (Misc.)		
56-4	11-2950	Phys. Rev. 104, 1723-9(1956)
56-6	11-3448	Nuovo cimento (10) 4, 1285-1306(1956)
57-8	11-10124	See AECU-3506
SURI-Ch.E.		
273-557F	11-1212	See AECU-3299
273-566F3	11-1213	See AECU-3301
273-566F4	11-1214	See AECU-3302
273-567F5	11-1541	See AECU-3374
273-5611F	11-5185	See AECU-3429
T		
9.40-2-2	11-13845	See M-5507
TEI		
193	11-3051	Phys. Rev. 104, 1629-32(1956)
319	11-2910	U. S. Geol. Survey Bull. 1030-J, 1956
350	11-7953	Anal. Chem. 29, 963-7(1957)
383	11-2911	U. S. Geol. Survey Bull. 1046-B, 1956
398	11-9291	Am. Mineralogist 42, 367-78(1957)
430	11-1118	U. S. Geol. Survey Bull. 1030-G, 1956.; $0.50(GPO)
433	11-3826	Econ. Geol. 51, 739-56(1956)
447	11-6723	Bull. Am. Assoc. Petroleum Geol. 41, 441-65(1957)
458	11-2909	U. S. Geol. Survey Bull. 1030-B, 1956
484	11-13551	Anal. Chem. 29, 1398-1406(1957)
485	11-5867	Geochim. et Cosmochim. Acta 11, 189-93 (1957)
489	11-6263	Anal. Chem. 29, 848-51(1957)
497	11-943	J. Sediment. Petrol. 26, 222-7(1956)
528-A	11-3406	Dep.; $0.40(OTS)
553	11-11192	Econ. Geol. 52, 438-55(1957)
556	11-291	J. Assoc. Offic. Agr. Chemists 39, 766-8 (1956)
569	11-6567	Am. Mineralogist 42, 191-203(1957)
574	11-1087	Univ. Texas Bur. Econ. Geol. Rept. Invest. No. 27, Sept. 1956
582	11-13328	Am. Mineralogist 42, 455-60(1957)
614	11-7952	Anal. Chem. 29, 954-7(1957)
620	11-10084	Dep.; $1.75(OTS)
633	11-10087	Econ. Geol. 52, 333-53(1957)
640	11-6357	Dep.; $1.50(OTS)
TEM		
293	11-3830	U. S. Geol. Survey Bull. 1030-K
846	11-4443	Econ. Geol. 52, No. 1, 25-35(1957)
832	11-10543	J. Sediment. Petrol. 27, 135-42(1957)
TEM		
930	11-7996	Econ. Geol. 52, 211-24(1957)
980	11-5864	Econ. Geol. 52, 180-91(1957)
TG		
7.1	11-12509	See TID-5451
TID		
85(1st Rev.)	11-12634	Dep.; $3.00(OTS)
452	11-13846	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3064	11-2226	Dep.; $0.30(OTS)
3067	11-12656	Dep.; $1.50(OTS)
3084	11-10049	Dep.; $0.60(OTS)
3307	11-992	Dep.; $0.30(OTS)
3309	11-1525	Dep.; $0.20(OTS)
3310	11-1133	Dep.; $0.15(OTS)
3501	11-5592	Dep.; $0.10(OTS)
3502	11-6695	Dep.; $0.25(OTS)
3503	11-5593	Dep.; $0.15(OTS)
3506	11-5393	Dep.; $0.10(OTS)
3506(1st Rev.)	11-12900	Dep.; $0.50(OTS)
3507	11-7956	Dep.; $0.15(OTS)
4005(Pt. I, 4th Ed.)	11-3847	Dep.; $0.65(OTS)
4562	11-3078	Dep.; Free (TISE)
5002	11-2831	Dep.; $9.30(ph OTS); $3.60(mf OTS)
5030	11-2282	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
5065	11-2726	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5068	11-2895	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
5074(Del.)	11-12984	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5094(Del.)	11-12985	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5143	11-2465	Dep.(mc); $55.80(ph OTS); $11.80(mf OTS)
5144	11-12517	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5145	11-10808	Dep.; $0.30(OTS)
5183	11-8758	Dep.; $0.35(OTS)
5187	11-2453	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
5191	11-12404	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5192	11-8299	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5202	11-12590	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5209	11-12340	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5220	11-833	Dep.; $2.10(OTS)
5223	11-11493	Dep.; $3.25(OTS)
5243(Rev.)	11-13808	Dep.; $0.50(OTS)
5246	11-8533	Dep.; $0.85(OTS)
5256(Rev.)	11-13099	Dep.; $0.70(OTS)
5272	11-2727	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
5304	11-10975	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
5305	11-4849	Dep.; $1.00(OTS)
5318	11-13021	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5341	11-11804	Dep.; $0.25(OTS)
5343	11-9700	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5351	11-7863	Dep.; $0.25(OTS)
5352	11-12591	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
TID		
5358	11-834	Dep.; $1.25(GPO)
5364	11-11685	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5367	11-12592	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5371	11-11805	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5392	11-8709	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5397	11-12593	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5423(Del.)	11-13849	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
5425(Del.)	11-13987	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5451	11-12509	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7005	11-10809	Dep.(mc); $53.30(ph OTS); $11.10(mf OTS)
7006	11-12028	Dep.; $2.25(GPO)
7007(Pt. 1)	11-3558	Dep.; $1.25(OTS)
7506(Pt. 2)	11-7864	Dep.(mc); $0.40(OTS)
7512	11-4804	Dep.; $3.00(GPO)
7516(Pt. 1)	11-1	Dep.; $1.50(OTS)
7517(Pt. 1)	11-1026	Dep.; $3.10(OTS)
7518(Pt. 1)	11-215	Dep.; $0.50(OTS)
7523(Pt. 1)	11-3428	Dep.; $0.70(OTS)
7524	11-6092	Dep.; $1.50(OTS)
7525	11-5028	Dep.; $1.50(OTS)
7526(Pt. 1)	11-4464	Dep.; $1.50(OTS)
7527	11-6185	Dep.; $1.00(OTS)
7528(Pt. 1)	11-1825	Dep.(mc); $0.50(OTS)
7530(Pt. 1)	11-6713	Dep.; $1.00(OTS)
7536(Pt.1)	11-12780	Dep.; $1.25(OTS)
7539	11-12901	Dep.; $5.50(OTS)
7540	11-10292	Dep.; $1.60(OTS)
8014	11-6093	Dep.; $0.15(OTS)
10000	11-9604	Dep.; $0.25(OTS)
10004	11-12594	Dep.(mc); $0.15(OTS)
10014	11-12595	Dep.(mc); $0.60(OTS)
10015	11-13185	Dep.(mc); $0.50(OTS)
10020	11-9870	Dep.; $1.10(OTS)
10022	11-9667	Dep.; $0.25(OTS)
10023	11-9605	Dep.; $0.30(OTS)
10027	11-11806	Dep.; $0.50(OTS)
10030	11-13988	Dep.(mc); $0.45(OTS)
10031	11-12596	Dep.(mc); $0.50(OTS)
10032	11-13186	Dep.(mc); $0.40(OTS)
10033	11-13210	Dep.(mc); $0.40(OTS)
10037	11-12597	Dep.(mc); $0.25(OTS)
10038	11-10976	Dep.; $0.45(OTS)
10044	11-12457	Dep.(mc); $0.35(OTS)
10047	11-13100	Dep.(mc); $0.25(OTS)
10048	11-12598	Dep.(mc); $0.65(OTS)
10052	11-10977	Dep.; $0.80(OTS)
10055	11-9871	Dep.; $0.25(OTS)
10057	11-12436	Dep.(mc); $0.30(OTS)
10058	11-12599	Dep.(mc); $0.55(OTS)
10064	11-9872	Dep.; $0.30(OTS)
10066	11-11002	Dep.; $0.40(OTS)
10075	11-12600	Dep.(mc); $0.30(OTS)
10076	11-9873	Dep.; $0.25(OTS)
10077	11-13989	Dep.(mc); $0.70(OTS)
10079	11-13048	Dep.(mc); $0.45(OTS)
10082	11-10978	Dep.; $2.40(OTS)
10085	11-12601	Dep.(mc); $0.30(OTS)
10086	11-12602	Dep.(mc); $0.40(OTS)
10091	11-13220	Dep.(mc); $0.30(OTS)
10097	11-11807	Dep.; $0.55(OTS)
10099	11-11715	Dep.; $0.25(OTS)
10100	11-8710	Dep.; $0.45(OTS)
10108	11-13101	Dep.(mc); $0.25(OTS)
10126	11-11666	Dep.; $0.60(OTS)
10138	11-11808	Dep.; $0.70(OTS)
10142	11-187	Dep.; $0.30(OTS)
10144	11-10810	Dep.(mc); $0.55(OTS)
10145	11-13598	Dep.(mc); $0.45(OTS)
10146	11-13599	Dep.(mc); $0.50(OTS)
10153	11-10811	Dep.(mc); $0.65(OTS)
10154	11-10812	Dep.(mc); $0.70(OTS)
10155	11-9589	Dep.; $0.70(OTS)
10156	11-12405	Dep.(mc); $0.80(OTS)
10157	11-10813	Dep.(mc); $0.60(OTS)
10158	11-9590	Dep.; $0.50(OTS)
10159	11-10814	Dep.(mc); $0.45(OTS)
10160	11-10858	Dep.; $0.40(OTS)
10161	11-12971	Dep.(mc); $1.35(OTS)
10162	11-12406	Dep.(mc); $0.60(OTS)
10171	11-9750	Dep.; $0.35(OTS)
10174	11-13022	Dep.(mc); $0.30(OTS)
TM (Misc.)		
3-54-54	11-2564	See AECU-3237
8-53-51	11-2492	See AECU-3225
10-53-53	11-2554	See AECU-3236
10-54-54	11-2566	See AECU-3248
12-55-53	11-2567	See AECU-3309
13-56-16	11-4161	See AECU-3392
25-54-54	11-2415	See AECU-3307
28-57-16	11-6341	See AECU-3454
30-57-14	11-7175	See AECU-3471
31-55-13	11-2568	See AECU-3310
34-57-51	11-5833	See AECU-3473
38-57-51	11-6436	See AECU-3440
40-53-54	11-2587	See AECU-3303
50-57-14	11-8069	See AECU-3465
51-57-14	11-8070	See AECU-3466
59-53-54	11-2596	See AECU-3304
64-57-51	11-7257	See AECU-3476
66A-57-51	11-10632	See AECU-3534
73-57-14	11-6434	See AECU-3438
75-55-13	11-2569	See AECU-3311

Report	Abstract	Availability
TM		
86-57-14	11-7241	See AECU-3475
88-57-12	11-7240	See AECU-3474
90-57-14	11-9383	See AECU-3502
91-57-14	11-8073	See AECU-3493
93-56-16	11-3947	See AECU-3393
95-54-51	11-2249	See AECU-3308
96-57-14	11-6437	See AECU-3457
101-56-51	11-6340	See AECU-3441
107-57-16	11-11244	See AECU-3541
112-57-14	11-8071	See AECU-3479
113-55-54	11-2562	See AECU-3222
114-57-12	11-8990	See AECU-3480
119-56-31	11-3668	See AECU-3594
119-57-14	11-11298	See AECU-3543
127-55-51	11-2589	See AECU-3312
128-55-51	11-2555	See AECU-3313
133-57-51	11-11284	See AECU-3533
137-57-16	11-10616	See SCDC-666
145-53-51	11-2585	See AECU-3203
151-54-51	11-2563	See AECU-3223
151-55-51	11-2540	See AECU-3224
165-57-51	11-11102	See AECU-3530
168-53-51	11-2588	See AECU-3305
171-57-51	11-12108	See AECU-3546
176-57-52	11-11245	See AECU-3542
179-57-51	11-11297	See AECU-3537
186-55-51	11-2590	See AECU-3314
188-57-52	11-12111	See SCDC-665
204-55-16	11-2444	See AECU-3315
207-56-14	11-8074	See AECU-3495
210-54-54	11-2586	See AECU-3235
214-53-16	11-2414	See AECU-3306
214-55-51	11-2424	See AECU-3230
217-55-54	11-2570	See AECU-3316
218-55-54	11-2571	See AECU-3317
220-55-53	11-6779	See AECU-3455
241-56-51	11-8079	See AECU-3485
253-54-51	11-2539	See AECU-3153
267-56-21	11-8072	See AECU-3490
271-56-14	11-8972	See AECU-3491
273-56-16	11-6733	See AECU-3456
288-56-51	11-9172	See AECU-3464
TNCC		
3	11-6509	Dep.; $0.30(OTS)
4	11-6510	Dep.; $0.30(OTS)
TNCC(US) (Misc.)		
17	11-8141	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25	11-9068	See CU-160
U		
047	11-12212	See AECU-3478

Report	Abstract	Availability
UCLA		
111	11-12315	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
143	11-12959	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
195(Del.)	11-13565	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
206	11-12960	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
267	11-12961	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
276	11-8258	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
307	11-2233	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
320	11-2237	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
329	11-7398	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
336	11-108	Dep.; $0.15(OTS)
338	11-1725	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
357	11-13566	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
362(Del.)	11-9576	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
371	11-8259	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
377	11-5241	Nature 179, 520-1(1957)
379	11-7695	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
380	11-897	Dep.(mc); $0.40(OTS)
382	11-1431	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
386	11-10803	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
388	11-7069	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
389	11-11939	J. Biol. Chem. 227, 1035-41(1957)
390	11-11994	J. Biol. Chem. 227, 1025-34(1957)
395	11-10043	Dep.(mc); $1.00(OTS)
401	11-10412	Dep.(mc); $0.40(OTS)
406	11-13247	Dep.(mc); $0.75(OTS)
UCRL		
400(Rev.)	11-12407	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
769	11-12341	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
868	11-2629	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
912(Del.)	11-13023	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
951	11-8723	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
961	11-11809	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1054	11-9591	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1062	11-2301	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1121	11-9883	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1124	11-10997	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1125	11-9884	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1130	11-2579	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1135	11-10998	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1137(Del.)	11-4136	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
1194	11-9757	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1195(Rev.)	11-2741	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
1196	11-2254	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1222	11-2744	Dep.; $0.40(OTS)
1229	11-14022	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1384	11-8733	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1597	11-3588	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1620	11-9903	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1651(Rev. 3)	11-12280	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1663	11-9874	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
UCRL		
1664	11-7431	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1676	11-8724	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1680(Del.)	11-13837	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
1686	11-7881	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1817	11-10999	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1820	11-717	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1847	11-9885	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1855	11-13187	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1885	11-14023	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1903(Del.)	11-13838	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
2021	11-8734	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2043(Del.)	11-13197	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
2063	11-9778	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2067	11-2742	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
2150	11-9773	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2194	11-9886	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2200	11-8549	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2229	11-2745	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2285	11-8567	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2318	11-8735	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2319	11-8725	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2426(Rev.) Vol. I	11-6867	Dep.; $0.50(OTS)
2426(Rev.) Vol. II	11-12281	Dep.; $2.50(OTS)
2474	11-9887	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2512	11-8568	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2705	11-8726	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2956(Rev.)	11-3023	Phys. Rev. 104, 1730-6(1956)
3021	11-4951	Nuovo cimento (10) 4, Suppl. 2, 361-6(1956)
3044	11-5468	Nuovo cimento (10) 4, Suppl. 2, 382-9(1956)
3071	11-959	Dep.; $7.80(ph OTS); $3.30(mf OTS)
3177	11-4709	J. Appl. Phys. 28, 273-6(1957)
3187	11-733	Rev. Sci. Instr. 27, 490-3(1956)
3194	11-1060	Vakuum-Technik 5, No. 6, 117-29(1956) (In German); Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3196	11-1461	J. Chem. Phys. 25, 1062-3(1956)
3248	11-781	Phys. Rev. 104, 99-100(1956)
3249	11-2852	J. Chem. Phys. 25, 1102-11(1956)
3329	11-780	Phys. Rev. 104, 91-9(1956)
3356	11-6157	Phys. Rev. 105, 1514-17(1957)
3361	11-1304	Phys. Rev. 104, 471-4(1956)
3365	11-3589	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3368 R	11-4595	Phys. Rev. 105, 693-706(1957)
3371	11-4994	Phys. Rev. 105, 1324-31(1957)
3372	11-3590	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3375	11-10693	Phys. Rev. 107, 1-6(1957)
3394	11-4114	Dep.(mc); $1.80(mf OTS); $1.80(mf OTS)
3397	11-749	Phys. Rev. 103, 1877-96(1956)
3418(Rev.)	11-1366	Phys. Rev. 104, 416-18(1956)
3421	11-386	Dep.; $18.30(ph OTS); $6.00(mf OTS)
3423	11-5823	J. Am. Chem. Soc. 79, 1563-5(1957)
3426	11-4115	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3428	11-718	Dep.; $0.20(OTS)
3429	11-1259	Nuovo cimento (10) 4, 834-55(1956)
3430(Rev.)	11-9402	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3434	11-6819	Dep.; $0.15(OTS)
3436	11-7380	Nuovo cimento (10) 4, 1583-4(1956)
3437	11-1351	Phys. Rev. 104, 434-48(1956)
3439	11-608	Phys. Rev. 104, 101-6(1956)
3440	11-3442	The Society of Plastics Engrs. J. 13, (1956); Dep.; $7.80(ph OTS); $3.30(mf OTS)
3442	11-3034	Phys. Rev. 104, 1315-19(1956)
3444	11-1357	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3447	11-2872	Biochim. Biophys. Acta 22, 398-9(1956)
3448	11-3033	Phys. Rev. 104, 1314(1956)
3450	11-4049	Phys. Rev. 105, 213-6(1957)
3459	11-1649	Phys. Rev. 104, 757-8(1956)
3475	11-595	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3476	11-1358	Dep.; $0.20(OTS)
3477	11-8232	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3478	11-6984	Phys. Rev. 106, 360-3(1957)
3480	11-20	Dep.; $0.15(OTS)
3482	11-1615	Phys. Rev. 104, 853-5(1956)
3486	11-5453	Nucleonics 15, No. 3, 74, 76-9(1957)
3487	11-3041	Phys. Rev. 104, 1380-1(1956)
3488	11-770	Dep.; $7.80(ph OTS); $3.30(mf OTS)
3489	11-911	Arch. Biochem. Biophys. 71, 1-10(1957); Dep.; $0.15(OTS)
3490	11-9019	Rev. Sci. Instr. 28, 421-4(1957)
3491	11-164	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3492	11-10787	Dep.; $0.20(OTS)
3493	11-3578	Dep.; $0.60(OTS)
3494	11-4154	Phys. Rev. 105, 302-10(1957)
3495	11-3579	Dep.; $0.30(OTS)
3498	11-13401	Phys. Rev. 107, 911-12(1957)
3499	11-3701	Dep.; $0.35(OTS)
3500	11-1777	J. Biol. Chem. 227, 449-64(1957) Dep.; $0.25(OTS)
3503	11-1406	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3504	11-1491	J. Exptl. Botany 8, No. 22, 147-56(1957); Dep.; $0.15(OTS)
3505	11-4622	Phys. Rev. 105, 729-30(1957)
3506	11-4948	Rev. Sci. Instr. 28, 80-3(1957)
3507	11-1610	Dep.; $0.15(OTS)
3508	11-10193	Rev. Sci. Instr. 28, 528-35(1957)
3510	11-6047	Phys. Rev. 105, 1507-11(1957)
3513	11-1182	Dep.; $0.15(OTS)
3514	11-1611	Dep.(mc); $0.25(OTS)
3516	11-698	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3519	11-3180	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3520	11-5514	Phys. Rev. 105, 1037-58(1957)
3521	11-1781	Dep.; $7.80(mf OTS); $3.30(mf OTS)
3524	11-1923	Dep.; $0.30(OTS)

Report UCRL	Abstract	Availability
3525	11-3975	Nuclear Instr. 1, 46-52(1957)
3530	11-2807	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3531	11-3356	Dep.; $0.20(OTS)
3533	11-2023	Phys. Rev. 104, 1193-7(1956)
3534	11-4221	Dep.; $0.20(OTS)
3535	11-2163	Phys. Rev. 106, 134-40(1957); Dep.; $0.25 (OTS)
3538	11-3524	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3539	11-1982	Dep.; $0.10(OTS)
3566	11-6851	Phys. Rev. 106, 591-5(1957)
3567	11-3720	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3568	11-4813	Dep.; $0.15(OTS)
3569	11-6178	Phys. Rev. 105, 1919-23(1957)
3571	11-8123	Phys. Rev. 106, 802-8(1957)
3572	11-9505	Phys. Rev. 106, 1031-42(1957)
3573	11-4227	Dep.; $0.25(OTS)
3574	11-5135	Dep.; $0.15(OTS)
3575	11-11340	Phys. Rev. 107, 585-7(1957)
3577	11-3977	Dep.; $0.30(OTS)
3580	11-3978	Dep.(mc); $10.80(ph OTS); $3.90(ph OTS)
3590	11-4936	Dep.; $0.20(OTS)
3591	11-6850	Phys. Rev. 106, 572-85(1957)
3593	11-4615	Dep.; $0.30(OTS)
3594	11-2968	Dep.; $0.30(OTS)
3595	11-3330	Dep.; $0.55(OTS)
3596	11-5478	Phys. Rev. 105, 1120(1957)
3597	11-3912	Dep.; $0.20(OTS)
3602	11-3390	J. Electrochem. Soc. 104, 521-3(1957); Dep.; $0.15(OTS)
3603	11-3580	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3604	11-4616	Dep.; $13.80(ph OTS); $4.80(mf OTS)
3605	11-10196	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3608	11-4723	Dep.; $0.15(OTS)
3609	11-6785	Dep.; $0.25(OTS)
3610	11-6879	Phys. Rev. 106, 553-4(1957)
3611	11-4997	Phys. Rev. 105, 1412-13(1957)
3614	11-4724	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3618	11-10246	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3620	11-5515	Phys. Rev. 105, 1127-8(1957)
3626	11-6049	Phys. Rev. 105, 1518-20(1957)
3627	11-4954	Phys. Rev. 105, 1417(1957)
3629	11-4814	Dep.; $0.50(OTS)
3630	11-11289	Phys. Rev. 107, 350-3(1957)
3633	11-4855	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3634	11-5747	Dep.; $0.25(OTS)
3635	11-4328	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3636	11-5072	Dep.; $0.25(OTS)
3641	11-5385	Dep.; $0.20(OTS)
3643	11-10707	Phys. Rev. 107, 189-95(1957)
3645	11-6061	Phys. Rev. 105, 1928-9(1957)
3650	11-10710	Phys. Rev. 107, 248-56(1957)
3653	11-5136	Dep.; $0.35(OTS)
3656	11-5057	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3657	11-11463	Phys. Rev. 107, 607-15(1957)
3658	11-6028	Phys. Rev. 106, 168-9(1957)
3668	11-9024	Rev. Sci. Instr. 28, 472-3(1957)
3678	11-11966	J. Phys. Chem. 61, 1021(1957)
3682	11-6942	Dep.; $0.20(OTS)
3688	11-9069	Dep.; $13.80(ph OTS); $4.80(mf OTS)
3689	11-6868	Dep.; $0.35(OTS)
3690	11-7131	J. Chem. Phys. 27, 758-63(1957); Dep.; $0.20(OTS)
3695	11-10760	Phys. Rev. 107, 141-54(1957)
3700	11-8824	Dep.; $0.20(OTS)
3702	11-6869	Dep.; $0.25(OTS)
3707	11-10689	Phys. Rev. 107, 239-48(1957)
3709	11-10121	Rev. Sci. Instr. 28, 584(1957)
3710	11-7091	Dep.; $0.50(OTS)
3712	11-7212	Dep.; $0.15(OTS)
3714	11-6632	Dep.; $0.15(OTS)
3718	11-11378	Phys. Rev. 107, 604-6(1957)
3721(Rev.)	11-13556	Phys. Rev. 107, 1145-7(1957)
3722	11-13461	Phys. Rev. 107, 1091-4(1957)
3723	11-9390	Dep.; $0.20(OTS)
3726	11-12847	Nuovo cimento (10) 6, 367-70(1957)
3733	11-8999	Dep.; $16.80(ph OTS); $5.70(mf OTS)
3746	11-7911	Dep.; $0.25(OTS)
3747	11-9028	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3748	11-10679	Phys. Rev. 107, 323-4(1957)
3749	11-9138	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3750	11-12922	Phys. Rev. 107, 859-67(1957)
3751	11-7934	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3757	11-8825	Dep.; $13.80(ph OTS); $4.80(mf OTS)
3758	11-9916	Dep.; $0.30(OTS)
3760	11-10267	Phys. Rev. 106, 1369-70(1957)
3762	11-10682	Phys. Rev. 107, 331-2(1957)
3763	11-11843	Dep.; $1.75(OTS)
3770	11-11361	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
3772	11-9266	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3773	11-11355	Phys. Rev. 107, 634-5(1957)
3774	11-10799	Phys. Rev. 107, 318-19(1957)
3775	11-12161	Dep.; $0.75(OTS)
3777	11-13529	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3782	11-10233	Dep.; $0.40(OTS)
3784	11-10197	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3793	11-11448	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3794	11-9403	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3796(Rev.)	11-13431	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3797	11-11461	Dep.; $1.00(OTS)
3802	11-10664	Dep.; $0.15(OTS)
3803	11-11349	Dep.; $0.25(OTS)
3805	11-10565	Dep.; $0.10(OTS)

Report	Abstract	Availability
UCRL		
3806	11-10423	Dep.; $0.15(OTS)
3809	11-12829	Phys. Rev. 107, 913(1957)
3810	11-10391	Dep.; $0.10(OTS)
3813	11-13392	Phys. Rev. 107, 1201(1957)
3815	11-11335	Dep.; $10.80(ph OTS); $3.90(mf OTS)
3839	11-12182	Dep.; $7.80(ph OTS); $3.30(mf OTS)
3848	11-12661	Dep.; $1.00(OTS)
3855	11-11362	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3858	11-12268	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3868	11-11363	Dep.; $2.25(OTS)
3872	11-11920	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3873	11-12644	Dep.; $0.75(OTS)
3877	11-12933	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
3879	11-12855	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3891	11-13396	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3892	11-13397	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3947	11-13530	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4303(Del.)	11-4116	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4439(Rev.)	11-1554	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4519(Rev.)	11-1183	Dep.; $0.35(OTS)
4529	11-993	Chem. Eng. Progr. 52, Symposium Ser. No. 19, 183-94(1956); Dep.(mc); $6.30 (ph OTS); $3.00(mf OTS)
4530	11-3453	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4575	11-1500	Nucleonics 14, No. 11, 113(1956)
4664	11-1681	Phys. Rev. 103, 1601-7(1956)
4680	11-526	Phys. Rev. 103, 1825-7(1956)
4712	11-1983	Dep.(mc); $0.25(OTS)
4713	11-596	Dep.; $0.20(OTS)
4714	11-5431	Dep.; $0.25(OTS)
4719	11-3899	Phys. Rev. 105, 46-50(1957)
4722	11-1930	Phys. Rev. 104, 1191-3(1956)
4732	11-4899	Dep.; $0.25(OTS)
4735	11-4763	Dep.; $0.20(OTS)
4741	11-11274	Astrophys. J. 125, 771-87(1957)
4745	11-1782	Acta Cryst. 10, 557-60(1957); Dep.; $0.20 (OTS)
4762	11-4937	Dep.; $0.15(OTS)
4763	11-12075	J. Chem. Phys. 27, 369-73(1957)
4764	11-10186	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4767	11-10120	Phys. Rev. 106, 1265-70(1957)
4768	11-10607	Phys. Rev. 106, 404-12(1957)
4769	11-4515	Dep.(mc); $0.25(OTS)
4803	11-11377	Phys. Rev. 107, 550-3(1957)
4808	11-9432	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4813	11-8177	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
4826	11-8158	Phys. Rev. 106, 837-8(1957)
4829	11-10137	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4830	11-9364	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4836	11-10138	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4861	11-12790	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
UCRL		
4871	11-12868	Phys. Rev. 107, 745-50(1957)
4880	11-10293	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4888	11-12289	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4891	11-11175	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4895	11-10139	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4900	11-13361	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
4917	11-11259	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4918	11-13268	Dep.; $0.50(OTS)
4919	11-13505	Dep.; $1.75(OTS)
UCRL-Trans		
192(L)	11-4117	Dep.(mc); JCL
240(1)	11-396	Dep.(mc) JCL
301	11-6637	Dep.(mc); JCL
307(L)	11-11287	Dep.(mc); JCL
308(L)	11-11287	Dep.(mc); JCL
UCSF		
13	11-21	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
14	11-6596	Dep.; $0.25(OTS)
15	11-13234	Dep.; $1.00(OTS)
UN-TR		
1	11-2303	See AECD-3866
UNM-TR-EE		
1	11-10617	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3	11-11319	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
UR		
309	11-4329	Dep.; $7.80(ph OTS); $3.30(mf OTS)
412	11-8851	J. Dental Research 36, No. 2, 192-202(1957)
459	11-7907	J. Nutrition 61, 207-17(1957)
463	11-109	Dep.; $19.80(ph OTS); $6.30(mf OTS)
464	11-835	Dep.; $4.80(ph OTS); $2.70(mf OTS)
465	11-836	Dep.; $3.30(ph OTS); $2.40(mf OTS)
467	11-826	Dep.; $3.30(ph OTS); $2.40(mf OTS)
468	11-894	Dep.; $1.80(ph OTS); $1.80(mf OTS)
469	11-4260	Dep.; $0.75(OTS)
474	11-8838	Dep.; $0.60(OTS)
475	11-4780	Dep.; $7.80(ph OTS); $3.30(mf OTS)
476	11-4805	Dep.; $3.30(ph OTS); $2.40(mf OTS)
477	11-1405	Dep.; $4.80(ph OTS); $2.70(mf OTS)
478	11-2808	Dep.; $4.80(ph OTS); $2.70(mf OTS)
480	11-3674	Dep.; $4.80(ph OTS); $2.70(mf OTS)
481	11-5137	Dep.; $1.80(ph OTS); $1.80(mf OTS)
482	11-9912	Dep.; $0.50(OTS)
483	11-6597	Radiation Research 7, 321(1957) (Abstract); Dep.; $13.80(ph OTS); $4.80(mf OTS)
484	11-5748	Dep.; $4.80(ph OTS); $2.70(mf OTS)
485	11-5180	Dep.; $3.30(ph OTS); $2.40(mf OTS)
486	11-6598	Dep.; $0.25(OTS)
487	11-9975	Dep.; $0.20(OTS)

Report	Abstract	Availability
UR		
488	11-9948	Dep.; $0.20(OTS)
489	11-9949	Dep.; $0.15(OTS)
490	11-10397	Dep.; $0.35(OTS)
491	11-11017	Dep.; $1.50(OTS)
492	11-8765	Dep.; $0.20(OTS)
496	11-12645	Dep.; $3.25(OTS)
497(Pt.2)	11-12646	Dep.; $3.50(OTS)
498	11-10392	Dep.; $0.25(OTS)
500	11-10424	Dep.; $0.35(OTS)
USBM-C		
36	11-10899	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
UWFL		
43	11-9192	Dep.; $0.50(OTS)
44	11-4261	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
45	11-4250	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
46	11-5965	Dep.; $0.30(OTS)
WAPD		
2	11-10979	Dep.; $0.65(OTS)
13	11-2728	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
15(Del.)	11-2768	Dep.; $0.30(OTS)
83(Del.)	11-13102	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
87	11-10980	Dep.; $0.30(OTS)
88	11-2527	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
93	11-10918	Dep.; $0.50(OTS)
98	11-10881	Dep.; $0.25(OTS)
99	11-2619	J. Appl. Phys. 26, 1235-8(1955); Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
104	11-13755	Dep.(mc); $0.25(OTS)
105	11-2593	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
107	11-10900	Dep.; $0.35(OTS)
110	11-2772	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
111	11-2528	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
115	11-2547	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
117	11-12603	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
120	11-2529	Dep.; $0.75(OTS)
122	11-2530	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
124	11-2531	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
125	11-8534	Dep.; $0.35(OTS)
126	11-13739	Dep.(mc); $0.35(OTS)
127	11-11716	Dep.; $0.85(OTS)
127(Pt. 2)	11-13323	Dep.; $4.00(OTS)
133	11-11717	Dep.; $0.45(OTS)
135	11-8535	Dep.; $0.40(OTS)
136	11-6351	Dep.; $0.30(OTS)
137	11-13600	Dep.(mc); $0.60(OTS)
139	11-6094	Dep.; $0.30(OTS)
140	11-11718	Dep.(mc); $0.30(OTS)
144	11-4214	Dep.; $0.30(OTS)
152	11-228	Dep.; $12.30(ph OTS); $4.50(mf OTS)
155	11-1141	Dep.; $0.45(OTS)
159	11-2123	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)

Report	Abstract	Availability
WAPD		
160	11-7361	Dep.; $0.25(OTS)
166	11-13507	Dep.; $1.50(OTS)
167	11-9108	Dep.; $0.50(OTS)
168	11-6444	Dep.; $0.25(OTS)
169	11-10294	Dep.; $0.55(OTS)
170	11-9480	Dep.; $0.30(OTS)
173	11-7384	Dep.; $0.25(OTS)
WAPD-AIW		
(FE)291	11-11719	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(IM)3	11-5299	Dep.; $0.35(OTS)
(M)307	11-13839	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
(P)82 and Add.	11-10639	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
(PCh)61	11-11226	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(PCh)89	11-337	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(RDM)397	11-13990	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-AD		
(P)987	11-1375	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(RM)18	11-3380	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-ADC		
22	11-4900	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
61	11-12604	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
96	11-11187	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
115	11-11177	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-B		
1	11-13729	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-B(C)		
242	11-13991	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
WAPD-BT		
1	11-12242	Dep.; $1.00(OTS)
2	11-12057	Dep.; $3.50(OTS)
WAPD-C		
(PC)18	11-11686	Dep.; $0.35(OTS)
115	11-13756	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
171	11-13508	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
188	11-5029	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
WAPD-CP		
79	11-13601	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
156	11-9875	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
287	11-2487	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
657	11-9669	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
950	11-13188	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1098	11-13992	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1121	11-13730	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1200	11-8711	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
WAPD-CPM		
1	11-8712	Dep.; $0.50(OTS)
2	11-8713	Dep.; $0.40(OTS)

Report	Abstract	Availability
WAPD-CPM		
3	11-3400	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WAPD-CTA		
(EC)305	11-11960	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
EL-2062	11-13993	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
EL-2112	11-13994	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
(EML)199	11-12501	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(EMX)230	11-13995	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(GLA)170 (Rev.1)	11-12676	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(GLA)306	11-11587	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
(GLA)371	11-12677	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(MP)39(Rev. 3)	11-12605	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
(RM)312	11-12510	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-EM		
2	11-10982	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
15	11-2729	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17	11-2454	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56	11-2466	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
88	11-2467	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
143-1	11-3800	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
159	11-2532	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
169	11-3913	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
174	11-3801	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
179	11-2455	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
212	11-13996	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WAPD-FE		
62	11-13809	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
68	11-13810	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
71	11-13811	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
77	11-13812	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
85(Rev.)	11-13757	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
96	11-654	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
152	11-13103	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
230	11-13813	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
231	11-13814	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
407	11-8536	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
434	11-10871	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
464	11-13997	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
525	11-13104	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
739	11-8537	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
762	11-13758	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
770	11-10983	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
784(Rev. 2)	11-13998	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
786	11-13999	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
795	11-14000	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
830	11-8714	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
867	11-9876	Dep.; $0.35(OTS)
898	11-2488	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
919	11-9877	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-FE		
928	11-11720	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
950	11-9878	
954	11-2533	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
979	11-9878	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1036	11-13815	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1071	11-13816	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1082	11-10569	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1105	11-11721	Dep.; $0.45(OTS)
WAPD-FEM		
60	11-14001	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-IPC		
256 and Add.	11-14002	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-LSR		
(C)134	11-6721	Dep.; $1.00(OTS)
(FE)3	11-3854	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
(IM)2	11-12606	Dep.(mc); $0.50(OTS)
(MM)43	11-13817	Dep.(mc); $0.25(OTS)
WAPD-M		
92	11-10984	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-MDM		
5	11-2534	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
10	11-8538	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
11	11-1078	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
25	11-11722	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28	11-12607	Dep.(mc); $0.55(OTS)
WAPD-MM		
184	11-13056	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
287	11-13818	Dep.(mc); $0.35(OTS)
491	11-11664	Dep.(mc); $0.50(OTS)
713	11-2489	Dep.(mc); $21.30(ph OTS); $6.90(mf OTS)
WAPD-MRP		
42	11-8715	Dep.; $0.40(OTS)
43	11-8716	Dep.; $0.45(OTS)
44(Rev.)	11-10986	Dep.(mc); $0.50(OTS)
45	11-8717	Dep.; $0.50(OTS)
46	11-8718	Dep.; $0.50(OTS)
47(Rev.)	11-10987	Dep.(mc); $0.60(OTS)
53	11-8720	Dep.; $0.85(OTS)
59	11-13189	Dep.(mc); $0.60(OTS)
63	11-12608	Dep.(mc); $0.60(OTS)
66	11-6909	Dep.; $0.45(OTS)
67	11-9109	Dep.; $0.45(OTS)
68	11-10737	Dep.; $0.55(OTS)
WAPD-NCE		
3308	11-11731	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3509	11-12609	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3608	11-10071	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
WAPD-P		
439	11-4008	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
513	11-14003	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
520	11-14004	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
652	11-655	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
663	11-5677	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
721	11-5594	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WAPD-PA		
169	11-12901	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
228	11-10989	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
WAPD-PM		
3	11-2594	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
26	11-2612	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
28	11-2613	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
32	11-10738	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
35	11-7265	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
41	11-10865	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
42	11-6801	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
44	11-8178	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
45	11-1269	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WAPD-PMM		
15	11-13820	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
120	11-11012	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
197	11-12437	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
276	11-14005	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
404(Del.)	11-13705	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-PWR		
CP-1723 and Add.	11-14032	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CP-1814	11-13759	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CP-1832	11-8721	Dep.; $0.30(OTS)
CP-1866	11-14006	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2027(Rev.)	11-10739	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2079	11-11430	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2126	11-5264	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
CP-2245	11-13509	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CP-2351(Del.)	11-13721	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CP-2428	11-11038	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2433	11-12058	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2541	11-12243	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2585	11-8179	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CP-2664	11-12610	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CP-2673	11-11649	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CP-2719	11-11431	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CP-2836	11-11432	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CP-2945	11-10520	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
CP-2995	11-11433	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
FE-1122	11-11810	Dep.; $0.25(OTS)
FE-1134	11-1054	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
FE-1138	11-14007	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
FE-1192	11-10902	Dep.; $0.40(OTS)
WAPD-PWR		
FE-1228	11-1063	Dep.(mc); $3.00(ph OTS); $2.40(mf OTS)
FE-1232	11-14008	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
FEm-78	11-12502	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
Ph-73	11-489	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
Ph-105	11-11434	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PMA-206	11-11667	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PMF-414	11-12023	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PMF-625	11-11811	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PMF-693	11-11435	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PMF-689	11-11435	
PMM-282	11-10901	Dep.; $0.50(OTS)
PMM-564	11-12751	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
PMM-622	11-12245	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
PMM-634	11-12244	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
PMM-637	11-12753	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
PMM-654	11-12752	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
PMM-1026	11-14009	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
PMM-1034	11-11812	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
PMM-1053	11-11227	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
PS-2672	11-12611	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
RD-107	11-5595	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
RDA-281	11-12612	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-RD		
22	11-3079	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40	11-2124	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
66	11-2125	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
87	11-1984	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-RDo		
60	11-10991	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-ReC(A)		
35	11-10992	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-ReM		
10	11-2730	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16	11-3815	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-RM		
35	11-2535	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54	11-2731	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
60	11-14010	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
91	11-2536	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
106	11-9765	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
109	11-2614	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
115	11-3959	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
116	11-13760	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
131	11-2456	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
133	11-2548	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
152	11-2537	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
156(Del.)	11-2926	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
160(Rev.)	11-13761	Dep.(mc); $1.50(OTS)
167	11-2732	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)

Report	Abstract	Availability
WAPD-RM		
169	11-13722	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
189	11-2538	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
198	11-2733	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
207	11-14011	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
215	11-13821	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
216	11-9751	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
219	11-2752	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
222	11-9758	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WAPD-S5W		
C-288	11-12446	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
TH(S)-352	11-12613	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-SC		
530	11-10295	Dep.; $0.70(OTS)
WAPD-STR		
L-583	11-2595	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
L-724	11-2457	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
(Ph)83	11-12627	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WAPD-T		
22	11-11723	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
23	11-11724	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
29	11-11825	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
46	11-13822	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
51	11-679	Trans. Am. Soc. Mech. Engrs. 78, 661-5 (1956)
66	11-4408	Dep.; $0.15(OTS)
88	11-4099	Dep.; $0.20(OTS)
149	11-14012	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
167	11-11725	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
173	11-12511	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
185	11-13823	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
188	11-1329	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
198	11-11726	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
208	11-5223	Acta Cryst. 10, 166-9(1957); Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
213	11-2904	Corrosion 13, 91-6(1957)
254	11-1870	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
259	11-5596	pp 269-78 in "Reactor Operational Problems. Vol. II. D. J. Hughes, S. McLain, and C. Williams, eds. New York, Pergamon Press, 1957. 285p." Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
279	11-6702	Power Apparatus and Systems 26, 1015 (1956)
283	11-8539	Dep.; $0.30(OTS)
294	11-1340	Nuclear Sci. and Eng. 1, 359-69(1956)
300	11-1711	J. Appl. Phys. 27, 1270-83(1956)
323	11-11813	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
326(Del.)	11-5030	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
340	11-12614	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
388	11-11814	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
389	11-11815	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
432	11-4100	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)

Report	Abstract	Availability
WAPD-TH		
19	11-6330	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
40	11-10993	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
53	11-10740	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
82	11-6331	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
114	11-14013	Dep.(mc); $0.35(OTS)
118	11-2734	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
131	11-4101	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
132	11-2735	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
153	11-2736	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
178	11-6332	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
183	11-6333	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
217	11-240	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
219	11-1185	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
225	11-10296	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
233	11-3794	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
241	11-1330	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
276	11-10297	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
289	11-10298	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
300	11-10061	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
304	11-10062	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
306	11-11166	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
308	11-10063	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
318	11-11167	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-TM		
1	11-10994	Dep.(mc); $0.70(OTS)
3	11-1575	Dep.; $0.30(OTS)
4	11-1270	Dep.; $0.40(OTS)
5	11-1363	Dep.; $0.25(OTS)
12	11-166	Dep.; $0.20(OTS)
13	11-1582	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
16	11-1507	Dep.; $0.20(OTS)
20	11-9391	Dep.; $0.40(OTS)
22	11-4765	Dep.; $0.20(OTS)
24	11-2126	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
26	11-3945	Dep.; $0.20(OTS)
28	11-4102	Dep.; $0.30(OTS)
29	11-7331	Dep.; $0.40(OTS)
31	11-5031	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
33	11-6802	Dep.; $0.20(OTS)
37	11-5846	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
39	11-6463	Dep.; $0.25(OTS)
40	11-5432	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
43	11-6910	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
46	11-7259	Dep.; $0.20(OTS)
47	11-10300	Dep.; $0.40(OTS)
51	11-10301	Dep.; $0.60(OTS)
52	11-7260	Dep.; $0.25(OTS)
53	11-10640	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
54	11-11436	Dep.; $0.50(OTS)
56	11-13306	Dep.; $0.75(OTS)
63	11-10683	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
WAPD-TM		
66	11-12903	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
67	11-13510	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
68	11-12806	Dep.; $0.50(OTS)
73	11-12000	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
WAPD-TN		
506	11-13223	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
508	11-2753	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
510	11-2760	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
511	11-2549	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
515	11-656	Dep.(mc); $0.40(OTS)
516	11-2550	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
523	11-8540	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WASH		
4 and Suppl. (Del.)	11-13732	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
125	11-13824	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
149	11-2473	Dep.(mc); $37.80(ph OTS); $11.10(mf OTS)
188	11-13858	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
189	11-13115	Dep.(mc); $0.40(OTS)
190	11-13116	Dep.; $0.40(OTS)
191	11-13117	Dep.(mc); $0.50(OTS)
192	11-5535	Dep.; $0.30(OTS)
193	11-10247	Dep.; $0.30(OTS)
298(Del.)	11-13042	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
701	11-8926	Dep.; $0.40(OTS)
734	11-5829	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WCAP		
145	11-14014	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
225	11-10302	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
299	11-7167	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
WIAP		
2	11-1028	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4	11-1040	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
7	11-1331	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
9	11-7865	Dep.; $0.45(OTS)
12	11-6537	Dep.; $1.85(OTS)
WIAP-M		
7	11-1332	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
24	11-1041	Dep.; $0.25(OTS)
30	11-1061	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
32	11-14015	Dep.(mc); $0.30(OTS)
36	11-4215	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
38	11-1042	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
WIAP-NM		
58	11-11462	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
WIN		
9	11-994	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
21	11-13293	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
28	11-4365	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
WIN		
33	11-995	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
34	11-934	Anal. Chim. 28, 1651-7(1956)
37	11-996	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
39	11-12705	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
43	11-2832	Dep.; $0.15(OTS)
45	11-1022	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
46	11-6260	Anal. Chem. 29, 756-9(1957)
48	11-1488	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
49	11-4366	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
50	11-4367	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52	11-931	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54	11-10480	Dep.; $4.50(OTS)
55	11-9999	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57	11-3761	Dep.(mc); $6.30(ph OTS); $3.30(mf OTS)
59	11-3363	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
60	11-6296	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
61	11-12706	Dep.; $7.80(ph OTS); $3.30(mf OTS)
62	11-4289	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
63	11-5782	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
65	11-5265	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
66	11-6684	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
67	11-5266	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
68	11-8872	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
69	11-7146	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
70	11-7147	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
72	11-8873	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
73	11-12707	Dep.; $6.30(ph OTS); $3.00(mf OTS)
74	11-12708	Dep.; $6.30(ph OTS); $3.00(mf OTS)
75	11-10481	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
86	11-11980	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
WIS-OOR (Non-AEC)		
15	11-6633	
WKNL		
7-26	11-13686	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
10	11-10915	See NYO-3923
15	11-9859	See NYO-3924
49	11-13190	Dep.(mc); $1.50(OTS)
WT		
1165	11-1750	Dep.; $0.25(OTS)
1168	11-2774	Dep.; $0.60(OTS)
1169	11-7040	Dep.; $0.30(OTS)
1175	11-9905	Dep.; $0.35(OTS)
1176A	11-10178	Dep.; $0.25(OTS)
1180	11-9906	Dep.; $0.30(OTS)
1181	11-11830	Dep.; $1.50(OTS)
1182	11-11039	Dep.; $0.25(OTS)
1183	11-1751	Dep.; $0.15(OTS)
1184	11-1856	Dep.; $0.40(OTS)
1186	11-9404	Dep.; $0.30(OTS)
1187	11-7243	Dep.; $0.15(OTS)
1197	11-1924	Dep.; $0.25(OTS)

Report	Abstract	Availability
WT		
1212	11-7070	Dep.; $0.50(OTS)
1215	11-3275	Dep.; $0.20(OTS)
1218	11-7922	Dep.; $1.10(OTS)
1222	11-1752	Dep.; $0.20(OTS)
XDC		
57-3-119	11-10174	See APEX-314
57-4-97	11-10065	See APEX-315
G		
57-5-83	11-10162	See APEX-316
57-5-91	11-10163	See APEX-317
57-5-114	11-10164	See APEX-318
Y		
22	11-12408	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
41	11-12409	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
163	11-12410	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
301	11-12352	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
348(Del.)	11-13602	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
350	11-7588	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
360	11-2359	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
388	11-13706	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
464	11-2404	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
467	11-11665	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
479	11-7559	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
501	11-2360	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
515	11-8553	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
519	11-12438	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
520	11-12411	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
522	11-8429	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
523	11-9764	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
747	11-2361	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
780	11-11559	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
794	11-2362	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
533	11-12615	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
536	11-12439	Dep.(mc); $0.70(OTS)
537	11-2583	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
571	11-2405	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
574	11-7432	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
584	11-9888	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
585(Del.)	11-11578	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
664	11-2406	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
706	11-3461	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
714	11-13057	Dep.(mc); $0.25(OTS)
731	11-3462	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
Y		
810	11-8298	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
823	11-2363	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
836	11-13571	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
838	11-7560	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
876(Del.)	11-13707	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
881(Del.)	11-14016	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
897	11-11560	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1091	11-2283	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1137 A	11-12059	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1140	11-932	Dep.; $0.20(OTS)
1143	11-110	Dep.
1144	11-1023	Dep.; $0.25(OTS)
1152	11-6657	Dep.; $0.25(OTS)
1153	11-5217	Dep.; $0.20(OTS)
1156	11-7935	Dep.; $0.30(OTS)
1173	11-12800	Dep.; $0.20(OTS)
Y-8		
15-19	11-13762	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
20-67	11-2551	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
22-24	11-2746	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22-25	11-2747	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
23-22	11-13859	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
31-84	11-7589	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
41-484	11-12342	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
46-114	11-12412	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
65-103	11-1826	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
Y-F		
8-6	11-2552	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30-1	11-3855	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
YAEC		
1	11-10303	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7	11-5032	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
13(Rev. 1)	11-5035	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
17	11-4694	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19	11-6095	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22	11-12246	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
23	11-12247	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
YALE(LA)		
3	11-13353	See AECD-4246
YE		
53-517	11-11011	See SEP-216

PART II

Report	Abstract	Availability
Numerical (Misc.)		
3-R-81	11-6614	See NARF-56-47T
56-RL-1606	11-5855	
A		
2293(WEC)	11-3831	
AD (Misc.)		
098922	11-7048	See AFPTRC-TN-57-19
1698	11-300	
1779	11-143	See MLCR-12
5114	11-13331	
11072	11-5349	See WADC-TR-56-456
11814	11-4888	See WADC-TR-56-374(Pt. 1)
25302	11-253	
36036	11-323	See WADC-TR-53-24(Pt. 2)
40138	11-1136	See WADC-TR-53-24(Pt.1)
47530	11-4493	See WADC-TR-53-471
50244	11-5325	
51056	11-11181	See WADC-TR-53-193(Pt. 2)
58608	11-3386	See WADC-TR-54-451(Pt. 2)
59870	11-4484	
59956	11-5055	
60859	11-4449	See ARE-50/54
61182	11-5222	
61308	11-1053	See WADC-TR-55-86(Pt.1)
61813	11-3385	See WADC-TR-54-451(Pt. 1)
63270	11-3849	See WADC-TR-54-214(Pt. I)
63661	11-448	
63670	11-449	
63967	11-8974	See WADC-TR-54-409(Pt. I)
67517	11-3009	See OSR-TN-55-203
68786	11-11318	See R-256(RAND)
69290	11-450	
69981	11-1052	See WADC-TR-54-531
72550	11-4626	See RAE-R-MET-86
72787	11-3267	
73567	11-6701	See WADC-TR-54-98(Pt. 2)
74328	11-3958	See WADC-TN-55-393
75227	11-3832	
76044	11-3904	
76707	11-5860	See NBTL-P-243
78071	11-5352	See TIB/T-4496
78107	11-5326	
78981	11-5363	
79063	11-160	See RAE-R-MET-87
79731	11-2	
80097	11-5351	See RAE-Lib/Trans-554
80652	11-4457	See NAA-AL-2064-12
80818	11-4458	See NAA-AL-2194
80851	11-3205	See WADC-TN-55-639
81080	11-5531	
81521	11-5371	See OSR-TN-56-89
81585	11-5244	

Report	Abstract	Availability
AD (Misc.)		
82260	11-4545	See WAL-372/19
82546	11-4469	See WAL-847/47
83186	11-5327	
84474	11-325	See WADC-TR-54-384(Pt. I)
85559	11-1175	
85788	11-3206	See WCRT-TN-54-255
86362	11-336	See WAL-710/930-6
86432	11-968	
86566	11-104	See ERI-2228-9-F
87327	11-1514	See WADC-TR-55-491
87522	11-539	See OSR-TN-56-208
87528	11-4782	See OSR-TR-56-19
87867	11-7223	
88158	11-73	
88438	11-1134	See TML-36
88913	11-828	
89082	11-1370	
89451	11-169	
89553	11-734	See SCEL-TM-1707
89650	11-1119	
89984	11-301	
90088	11-335	See WAL-691.1/44
90524	11-2925	See WADC-TR-55-199(Pt. 1)
91458	11-6148	
91625	11-302	
91930	11-277	See RAE-TN-MET-219
92001	11-3387	
92143	11-462	See TIB/T-4535
92159	11-5372	See TIB/T4520
92318	11-113	See TIB/T-4499B
92319	11-933	See TIB/T4499A
93172	11-324	See WADC-TR-53-190(Pt. 4)
93270	11-483	See ARDE(M)-2/56
93436	11-170	
93571	11-964	See WADC-TN-55-686
93596	11-319	See RAE-TN-MET-235
93752	11-829	
93862	11-9345	See WADC-TR-54-409(Pt. 2)
93911	11-1723	
94417	11-1176	
94449	11-1062	
94649	11-1120	
94819	11-1047	
94820	11-1048	
95105	11-1415	
95121	11-230	
95136	11-2912	
95183	11-921	Anal. Chem. 28, 2006-11(1956)
95329	11-260	See WADC-TR-55-473
95406	11-4817	See AF-TR-6145(Pt. 3)
95491	11-7065	
95752	11-5840	See WADC-TR-55-422(Pt. 1)

Report	Abstract	Availability
AD (Misc.)		
95807	11-1581	See OSR-TR-56-32
95818	11-385	See OSR-TN-56-282
96060	11-6387	See OSR-TN-56-402
96137	11-5345	See WADC-TR-56-37
96302	11-12788	See AFSWC-TR-56-34
96791	11-5858	See OSR-TN-56-446
97076	11-259	See OSR-TN-56-459
97185	11-327	See WADC-TR-55-496
97194	11-3703	See WADC-TR-56-300
97199	11-1138	See WADC-TR-55-325(Pt. II)
97200	11-328	See WADC-TR-55-510
97214	11-330	See WADC-TR-56-343
97215	11-329	See WADC-TR-56-242
97233	11-80	See WADC-TR-56-318
97240	11-3852	See WADC-TR-56-181
97254	11-4741	See WADC-TR-56-296
97283	11-1051	See WADC-TR-54-270(Pt.2)
97284	11-1526	See WADC-TR-55-454(Pt. 2)
97285	11-5892	See WADC-TR-56-372
97287	11-5853	See WADC-TR-54-98(Pt. 3)
97302	11-1039	See WADC-TR-54-100(Pt.2)
97318	11-7981	See WADC-TR-53-466(Pt. 2)
97334	11-1413	See WADC-TR-53-133(Pt. 3)
97335	11-1414	See WADC-TR-53-133(Pt. 3, Suppl. 1)
97527	11-326	See WADC-TR-54-384(Pt. II)
98299	11-3412	
98464	11-3324	
98974	11-443	See AEDC-TN-56-12
98978	11-5940	See AEDC-TR-56-7
99183	11-255	See WADC-TN-56-40
99227	11-5308	See ALI-C-59291
99655	11-6347	See WADC-TR-56-137
99657	11-8076	See WADC-TR-56-178
99659	11-4856	See WADC-TR-56-139
99660	11-4857	See WADC-TR-56-140
101980	11-6352	
102103	11-3722	See RAE-Lib/Trans-564
102107	11-3723	See RAE-Lib/Trans-571
102475	11-3724	See RAE-Lib/Trans-574
102749	11-4184	
103012	11-3364	See TIL/T4601
103038	11-5346	See WADC-TR-56-220
103367	11-3833	
103599	11-5871	
103744	11-3806	
104272	11-10549	
104315	11-5307	See WADC-TR-56-85
104424	11-5854	See RAE-Lib/Trans-576
105099	11-6362	
105100	11-5872	
105431	11-5755	
106844	11-1499	
107075	11-5881	See MS-PR-55-68

Report	Abstract	Availability
AD (Misc.)		
107256	11-5861	See WADC-TR-56-237
107409	11-822	See T-42((Pt. II(Rand))
107820	11-5756	
108091	11-6229	
108450	11-6363	
109936	11-6800	See RM-1724(RAND)
110308	11-6276	See OSR-TN-56-494
110342	11-1203	See OSR-TN-56-524
110344	11-1131	See OSR-TR-56-54
110354	11-1638	See OSR-TN-56-535
110374	11-11218	See OSR-TN-56-555
110381	11-2220	See OSR-TN-56-561
110383	11-2964	See OSR-TN-56-587
110402	11-1137	See WADC-TR-54-485(Pt. III)
110404	11-1527	See WADC-TR-55-495(Pt. 1)
110409	11-1139	See WADC-TR-56-327
110410	11-1515	See WADC-TR-56-250
110412	11-1432	See WADC-TR-54-616(Pt. II)
110439	11-2924	See WADC-TR-54-616(Pt. III)
110440	11-2901	See WADC-TR-55-470(Pt. 2)
110458	11-6421	See WADC-TR-56-222(Pt. 1)
110460	11-3853	See WADC-TR-56-269
110470	11-1140	See WADC-TR-56-421
110501	11-4222	See WADC-TR-56-273
110510	11-5891	See WADC-TR-55-495(Pt. 2)
110526	11-2937	See WADC-TR-55-495(Pt. III)
110540	11-3851	See WADC-TR-55-199(Pt. II)
110541	11-3429	See WADC-TR-56-88
110542	11-10588	See WADC-TR-56-452
110570	11-4466	See WADC-TR-54-17(Pt. 3)
110571	11-5893	See WADC-TR-56-409
110582	11-7169	See WADC-TR-56-486
110583	11-3850	See WADC-TR-54-355(Pt. 3)
110585	11-11223	See WADC-TR-56-375
110596	11-11222	See WADC-TR-56-319
110636	11-6321	See WADC-TR-56-267
110644	11-4851	See WADC-TR-56-430(Pt. 1)
110673	11-5344	See WADC-TR-55-458(Pt. 2)
110682	11-4467	See WADC-TR-56-469
110708	11-5348	See WADC-TR-56-454
110716	11-5890	See WADC-TN-55-290(Pt. 2)
110726	11-5347	See WADC-TR-56-304
110733	11-5733	See WADC-TR-56-433
110736	11-12024	See WADC-TR-55-491(Pt. 2)
110737	11-5895	See WADC-TR-56-545
110748	11-6743	See WADC-TR-56-597
111346	11-12730	See BW-5356
112231	11-5238	See PA-TR-2371
112377	11-3077	See RM-1814(RAND)
112406	11-9344	See RM-1844(RAND)
112410	11-6908	See RM-1835(RAND)
112460	11-12791	

Report	Abstract	Availability
AD (Misc.)		
113849	11-6691	
115001	11-6328	See ERI-2323-9-F
115008	11-6443	See OSR-TN-56-584
115011	11-3876	See OSR-TR-56-56
115039	11-5053	See OSR-TN-57-7
115045	11-11165	See UTIA-41
115343	11-11161	See EES-030038
118011	11-6742	See WADC-TR-56-453
118032	11-4381	See WADC-TR-57-11
118047	11-5896	See WADC-TR-56-579
118054	11-5302	See WADC-TR-56-663
118062	11-10177	See WADC-TR-56-548
118088	11-5490	See WADC-TR-57-89
118107	11-5894	See WADC-TR-56-411
118111	11-6150	See WADC-TR-56-557(Pt. 1)
118118	11-6392	See WADC-TR-56-580
118122	11-11221	See WADC-TR-55-207
118135	11-6391	See WADC-TR-53-230(Pt. 3)
118136	11-5897	See WADC-TR-57-30
118192	11-8924	See WADC-TR-56-481
118195	11-7180	See WADC-TR-56-329
118202	11-11474	See WADC-TN-57-120
118204	11-8011	See WADC-TR-57-40
118210	11-8010	See WADC-TR-56-550
118224	11-8009	See WADC-TR-56-521
118244	11-10521	See WADC-TR-56-440
118272	11-10651	See WADC-TR-56-657
118278	11-8908	See WADC-TR-57-32
118293	11-11220	See WADC-TR-53-24(Pt. 4)
118304	11-10429	See KLX-10043
118346	11-8925	See WADC-TR-57-154
120144	11-12740	See BW-395
120421	11-4885	See OSR-TR-57-12
120464	11-11346	See OSR-TN-57-111
120487	11-7293	See OSR-TN-57-131
120488	11-6168	See OSR-TN-57-132
120489	11-6169	See OSR-TN-57-133
120678	11-7120	
120679	11-7121	
121406	11-12694	See RIA-55-3641
122333	11-12792	
126225	11-12793	
126439	11-6388	See OSR-TN-57-150
126440	11-7976	See OSR-TN-57-151
126478	11-10512	See OSR-TN-57-183
130754	11-10523	See WADC-TR-57-39
130779	11-11224	See WADC-TN-57-231
130797	11-11089	See WADC-TR-56-455
130801	11-10465	See WADC-TR-56-465
130802	11-10519	See WADC-TR 57-297
130823	11-13343	See WADC-TR-57-298(Pt. 1)
130824	11-13344	See WADC-TR-57-298(Pt. 2)
130825	11-13345	See WADC-TR-57-298(Pt. 3)
130847	11-13342	See WADC-TR-57-251(Pt. 1)
130857	11-13284	See WADC-TR-57-141
130864	11-12812	See WADC-TN-56-191(Pt.1)
130872	11-12687	See WADC-TR-56-540
132384	11-12070	See OSR-TN-57-313
133018	11-13359	See RM-1922(RAND)
AECL (Canadian)		
131	11-5126	See DL-15
249	11-1319	See CRNE-558
281	11-772	Dep.; Can. J. Phys. 34, 256-64(1956)
334	11-688	Dep.; Can. J. Phys. 34, 745-66(1956)
335	11-554	Dep.; Can. J. Phys. 34, 804-29(1956)
336	11-1267	See MT-12
343	11-1278	See PR-P-30
346(Add.)	11-6036	See CRRP-659(Add.)
351	11-1643	Nuclear Phys. 2, 132-46(1956)
352	11-3549	See CRRP-662
354	11-862	Radiation Research 5, 382-9(1956)
355	11-897	Nuclear Sci. and Eng. 2, 363-72(1957)
356	11-9463	Dep.
359	11-4554	See TPI-68
360	11-1864	See CRDC-645
361	11-2134	Brit. J. Appl. Phys. 5, Suppl. 96-100 (1956)
362	11-2131	Brit. J. Appl. Phys. 5, Suppl. 54-9(1956)
363	11-1320	See CRRP-669
364	11-1636	See CRRP-667
365	11-2027	See PR-P-31
366	11-2899	See CRDC-646
367	11-668	Nucleonics 14, No. 10, 28-31(1956)
368	11-1231	See CRT-671
369	11-6919	J. Nuclear Energy 4, 445-59(1957)
370	11-2761	See CREL-675
373	11-3482	Can. J. Phys. 35, 1-15(1957)
375	11-6527	See CRNE-551
377	11-3076	See MT-241
379	11-6529	See CRT-359
380	11-3348	Can. J. Chem. 35, 82-8(1957)
381	11-2976	See CRT-668
382	11-3550	See DR-39
384	11-4915	Can. J. Phys. 35, 168-83(1957)
385	11-5448	Phys. Rev. 105, 976-81(1957)
387	11-4976	Can. J. Phys. 35, 147-54(1957)
388	11-3548	See CRHP-677
389	11-4977	Can. J. Phys. 35, 155-67(1957)
390	11-4959	Can. J. Phys. 35, 195-207(1957)
392	11-5625	Phys. Rev. 105, 957-73(1957)
393	11-4165	See CRDC-653

Report	Abstract	Availability
AECL (Canadian)		
395	11-4681	See DR-22(Rev. 2)
397	11-4928	Phys. Rev. 105, 1337-8(1957)
399	11-9100	See CRNE-582
400	11-5538	Can. J. Phys. 35, 258-70(1957)
401	11-6078	See CRNE-512
402	11-5017	See CRIO-684
403	11-6893	See CRR-578(Rev.)
404	11-4779	See DL-28A
405	11-5016	See CRE-678
406	11-5271	Chem. Eng. Progr. 53, 82F-5F(1957)
407	11-4631	See CRRP-680
410	11-6483	Can. J. Phys. 35, 363-72(1957)
411	11-6079	See CRRP-685
412	11-6495	Can. J. Phys. 35, 398-409(1957)
415	11-6272	Can. J. Phys. 35, 462-9(1957)
417	11-5578	See DL-29
418	11-6890	See CEI-79
420	11-9051	CRP-615
421	11-5879	See CR-MET-683
422	11-6023	Phys. Rev. 106, 16-18(1957)
423	11-6547	Can. J. Phys. 35, 470-6(1957)
424	11-5817	See CRCE-676
426	11-6528	See CRRP-672
428	11-6681	See CRDC-687
429	11-7141	See CRDC-630
430	11-9134	Nucleonics 15, 124-9(1957)
432	11-11404	See CRC-696
433	11-8138	See CRP-690
434	11-9473	See CREL-698
435	11-6814	See CREL-605
436	11-6894	See DM-42
437	11-6680	See CRDC-614
438	11-7287	Can. J. Phys. 35, 576-93(1957)
439	11-7270	Can. J. Phys. 35, 570-5(1957)
440	11-7296	Can. J. Phys. 35, 666-71(1957)
441	11-7954	Can. J. Chem. 35, 541-51(1957)
442	11-7958	See CRC-693
443	11-10072	See CRHP-692
446	11-10281	See CRT-682
447	11-11406	See CRR-622(Rev.)
448	11-9054	See PR-P-33
449	11-10225	See CR-MET-702
452	11-9401	See CRL-42
453	11-10685	See CRC-694
454	11-11273	See CRL-41
455	11-10151	Rev. Sci. Instr. 28, 542-3(1957)
456	11-10726	See CRE-707
459	11-11947	See CRC-713
461	11-13489	See CRT-715
463	11-12882	See CRDC-647
464	11-12254	Can. J. Chem. 35, 980-5(1957)
465	11-11248	See CRL-43
470	11-12635	See CRB-717
472	11-12857	Can. J. Phys. 35, 1042-56(1957)
473	11-11405	See CRL-44
474	11-12858	Can. J. Phys. 35, 1057-85(1957)
478	11-11490	See DM-44
481	11-13266	See CRDC-704
AEDC-TN		
56-12	11-443	
AEDC-TR		
56-7	11-5940	
AERE-C/M (British)		
14	11-5277	
23	11-3769	
31(Del.)	11-4356	
39	11-4564	
66(Del.)	11-6249	
79	11-4280	
89(Del.)	11-4281	
92	11-4382	
104	11-4383	
109	11-3691	
113	11-4384	
137	11-4485	
147	11-5251	
148	11-13288	
150	11-5236	
155	11-6250	
157	11-4385	
172	11-10455	
180	11-5207	
185	11-3905	
186	11-4357	
218	11-5208	
224	11-2896	
237	11-4317	
243	11-4446	
252	11-5252	
258	11-5824	
281	11-634	Dep.
283	11-922	
291	11-8944	J. Chem. Soc. 2161-3(1957)
292	11-3372	
294	11-6780	
298	11-5567	Dep.
300	11-10495	
301	11-5757	Dep.
319	11-13263	Dep.; $0.18
AERE-C/R (British)		
255	11-3336	

Report	Abstract	Availability
AERE-C/R (British)		
286	11-4246	
289	11-10033	
340	11-10508	
349	11-4552	
403(App.)	11-11246	
517	11-10485	
518	11-11119	
607	11-9996	
662	11-10489	
712	11-5280	
779	11-6663	
780	11-4386	
846	11-4390	
865	11-3770	
874	11-3692	
881	11-4565	
915	11-10146	
933(Del.)	11-6230	
985	11-5911	
1045	11-9997	
1055	11-10040	
1113	11-4358	
1150	11-5773	
1207	11-3771	
1212	11-4359	
1217	11-6694	
1287	11-4282	
1294	11-1497	Dep.
1404	11-5209	
1491	11-195	Can. J. Chem. 34, 1471-82(1956)
1537(Del.)	11-6679	
1547	11-3767	
1553	11-5774	Dep.
1563	11-6251	
1567	11-5186	
1592	11-5221	Spectrochim. Acta 7, 231-7(1955)
1598	11-2867	Chem. Eng. Sci. 5, No. 5, 201-8(1956)
1606	11-5775	Dep.
1631	11-2841	Spectrochim. Acta 8, 167-79(1956)
1652	11-12715	
1654	11-3693	
1656	11-5228	Spectrochim. Acta 8, 57-65(1956)
1661	11-3747	
1668	11-4373	Dep.; $0.45
1703	11-6309	J. Chem. Soc. 3531-40(1956)
1716	11-6415	
1740	11-3694	
1767	11-5669	Chem. Indust. No. 45, 1348-50(1956)
1795	11-5274	J. Chem. Soc. 509-12(1957)
1822	11-1447	Anal. Chim. Acta 15, 573-9(1956)
1867	11-95	J. Chem. Soc., 3385-9(1956)
1877	11-942	Analyst 81, 570-7(1956)
1896	11-4360	Dep; $0.24
1901	11-1371	
1947	11-4308	Analyst 82, 50-61(1957)
1961	11-1425	J. Chem. Soc., 4579-82(1956)
1993	11-4302	Anal. Chim. Acta 16, 109-14(1957)
2042	11-10444	Analyst 82, 228-33(1957)
2049	11-6403	J. Chem. Soc. 1044-6(1957)
2054	11-7263	Dep.; $0.63
2060	11-9232	Analyst 82, 390-406(1957)
2081	11-7107	Dep.; $0.27
2083	11-6308	J. Inorg. and Nuclear Chem. 4, 93-9(1957)
2091	11-9397	Dep.; $0.54
2099	11-4387	Dep.; $0.45
2114	11-6252	Dep.; $0.45
2115	11-4283	Dep.; $0.54
2137	11-13265	Dep.
2145	11-11094	Analyst 82, 483-8(1957)
2152	11-10786	$0.45
2163	11 11992	Dep.; $0.45
2165(App.)	11-7066	
2202	11-12005	Dep.
2260	11-13289	Dep.
AERE-CE/M (British)		
24	11-5187	
76	11-3748	
94	11-3749	
126	11-13279	
172	11-303	Dep.
184	11-13316	
186	11-235	Dep.
188	11-4425	Dep.
197	11-13333	
198	11-13252	
200	11-13305	
AERE-CE/R (British)		
820	11-3906	$1.08
968	11-6291	
1283	11-10487	
1382	11-5282	
1698	11-10548	Trans. Inst. Chem. Engrs. (London) 35, 125-56(1957)
1887	11-10547	Trans. Inst. Chem. Engrs. (London) 35, 111-24(1957)
2170	11-13334	
2257	11-13224	Dep.; $1.80
AERE-CP/R		
1572	11-13383	

Report	Abstract	Availability
AERE-CP/R		
1966	11-4532	$1.17
AERE-E/M (British)		
65	11-5237	
76	11-5568	
AERE-E/R (British)		
510	11-4654	
549	11-4410	
1095	11-10054	
AERE-ED/D (British)		
10(Issue 2)	11-5758	
52	11-3715	
AERE-ED/M (British)		
11	11-13307	Dep.; $0.27
26	11-2887	Dep.
AERE-ED/R (British)		
1467	11-6342	
1824	11-5305	Engrg. 181, No. 4703, 264-8(1956)
AERE-EL/M (British)		
45	11-3948	
46	11-3949	
66	11-10147	
73	11-3907	
74	11-6468	
77	11-5941	
96	11-4284	Dep.; $0.45
AERE-EL/R (British)		
1080	11-10148	
1972	11-5437	Dep.
AERE-ES/M (British)		
21	11-10459	Dep.
AERE-ES/R		
2089	11-7138	Dep.
2124	11-6664	Dep.; $0.63
AERE-G/M (British)		
126	11-6127	
131	11-5942	
136	11-12953	
137	11-6554	
142	11-5943	
145	11-10327	
AERE-G/R (British)		
168	11-6781	
1097	11-2184	Acta Cryst. 9, 1029-35(1956)
2055	11-4411	$2.34

Report	Abstract	Availability
AERE-GP/M (British)		
146	11-6128	
147	11-10328	
155	11-5944	
156	11-5632	
166	11-6129	
171	11-5945	
172	11-5681	
189	11-4324	
191	11-13384	
194	11-10630	
195	11-5366	Dep.
196	11-6776	
201	11-13317	Dep.
AERE-GP/R (British)		
1246	11-4135	
1285	11-5759	
1402	11-6280	
1694	11-5408	
1741	11-4533	
1918	11-383	Dep.(mc)
1937	11-453	Dep.; $0.50
1962	11-3439	Dep.
1967	11-454	
2028	11-4525	
2050	11-5633	Dep.
2058(Pt. 1)	11-10469	
2069	11-4721	Dep.; $0.63
2071	11-3102	Dep.; $0.36
2072	11-3103	Dep.; $0.99
2095	11-7341	Dep.; $0.63
2186	11-9497	$0.90
2205	11-13524	Dep.; $1.08
2238	11-13378	Dep.
2279	11-13298	Dep.
AERE-H/PhC (British)		
41	11-11391	
AERE-H/R (British)		
193	11-4566	
AERE-HP (British)		
M-4	11-4391	See AERE-M/M-12
M-16	11-4567	
M-24	11-4247	
M-27	11-4217	
M-43	11-4417	
M-80	11-4388	
M-110	11-892	Dep.
M-112	11-4418	

Report	Abstract	Availability
AERE-HP (British)		
R-551	11-2796	
R-2017	11-3295	Dep.
R-2056	11-46	Dep.
R-2056 (Amended)	11-9201	Dep.; $1.26
R-2182	11-5171	Dep.
AERE-I/M (British)		
26	11-10171	
35	11-6654	
43	11-7067	
AERE-I/R (British)		
1653	11-5403	
AERE-Inf/Bib (British)		
49(Rev.)	11-5488	
53	11-3908	
58	11-4325	
90 Suppl. 1	11-6492	Dep.; $0.54
93(4th. Ed.)	11-6345	
96(Suppl. 1)	11-8760	Dep.; $1.08
97(2nd. ed.)	11-7043	Dep.
104	11-1031	Dep.
105	11-4655	Dep.; $0.36
106	11-6883	Dep.; $0.72
108	11-3415	Dep.
109	11-4321	Dep.; $0.27
110	11-9187	Dep.; $0.72(OTS)
112	11-9089	Dep.; $0.63
AERE-Lib/L		
1	11-6594	Dep.
AERE-Lib/Trans (British)		
513	11-205	Dep.
614	11-341	
635	11-3877	Dep.
666	11-111	Dep.
672	11-1144	Dep.
673	11-5328	Dep.
677	11-6446	Dep.
680	11-597	Dep.
683	11-460	Dep.
689	11-4322	Dep.
693	11-5769	Dep.
694	11-6298	
695	11-13312	Dep.
715	11-229	Dep.
722	11-470	Dep.
726	11-12671	
728	11-10571	
729	11-87	Dep.
AERE-Lib/Trans (British)		
732	11-422	Dep.
733	11-423	Dep.
735	11-11091	
741	11-389	Dep.
744	11-13349	Dep.
749	11-11048	
750	11-4495	Dep.
752	11-436	Dep.
753	11-112	Dep.
754	11-284	Dep.
760	11-12672	
762	11-88	
763	11-1145	Dep.
771	11-414	Dep.
775	11-241	
780	11-6566	Dep.
821	11-3349	Dep.
AERE-M/M (British)		
12	11-4391	Dep.
41	11-10078	
46	11-9322	
56	11-5876	
64	11-6580	
67	11-10034	Instn. Min. Metall. Symposium on the Extraction Metallurgy on Some of the Less Common Metals. Mar. 1956. 49-65(1957). pp. 49-71 in "Extraction and Refining of the Rarer Metals. London, The Institution of Mining and Metallurgy, 1957. 459p."
80	11-4606	
97	11-12047	
116	11-269	Dep.
121	11-4069	
127	11-8914	J. Nuclear Energy 5, No. 1, 1-3(1957)
130	11-3577	
138	11-4607	Dep.
148	11-9285	Dep.
153	11-13321	
AERE-M/R (British)		
509	11-10496	
795A	11-6364	
799	11-10497	
1075	11-4761	
1181	11-4447	
1235	11-5283	
1281	11-10498	
1417	11-10585	
1442	11-5877	
1497	11-12954	
1631	11-2841	Spectrochem. Acta 8, 167-79(1956)
1638	11-10550	

Report	Abstract	Availability
AERE-M/R (British)		
1734	11-1854	J. Nuclear Energy 3, 1-6(1956)
1768	11-1158	J. Inorg. and Nuclear Chem. 3, 190-3(1956)
1769	11-5361	Phil. Mag. (8) 2, 259-83(1957)
1815	11-1150	Acta Met. 4, 611-18(1956)
1863	11-8216	Phil. Mag. (8) 2, 607-27(1957)
1866	11-3866	J. Inst. Metals 85, 145-52(1956)
1878	11-1172	Proc. Roy. Soc. (London) A237, 413-21 (1956)
1934	11-1064	J. Nuclear Energy 4, 164-78(1957)
1969	11-1389	Phil. Mag. (8) 1, 711-17(1956)
1990	11-9246	J. Inst. Metals 85, 431-6(1957)
2006(Pt. 1)	11-10601	Proc. Roy. Soc. (London) A239, 184-91 (1957)
2006(Pt. 2)	11-10602	Proc. Roy. Soc. (London) A239, 192-201 (1957)
2009	11-761	
2045	11-10093	Acta Met. 5, No. 7, 371-6(1957)
2046	11-4264	Dep.
2250	11-13486	Dep.; $0.90
AERE-M/TN (British)		
12	11-10427	
28	11-6281	J. Soc. Glass Tech. 40, 18-24(1956)
37	11-256	Brit. J. Appl. Phys. 7, 345-50(1956) Oct.
AERE-Med-M		
17	11-13253	Dep.; $0.32
AERE-Med/R (British)		
2098	11-5129	Dep.
2107	11-9919	Brit. J. Radiol. 30, 295-7(1957)
AERE-MRC/R (British)		
1952	11-12636	Biochem. J. (London) 67, 97-103(1957)
2030	11-12637	Biochem. J. (London) 67, 104-9(1957)
AERE-N/M (British)		
27	11-12779	
28	11-4629	
59	11-4706	
60	11-5438	
61	11-5329	
62	11-4033	
64	11-6035	
71	11-5439	
AERE-N/PC (British)		
2	11-6271	
14	11-5233	
20	11-5569	
AERE-N/R (British)		
133(Del.)	11-4070	
305	11-4486	
AERE-NP/GEN (British)		
3	11-11387	Proc. Phys. Soc. (London) A70, 573-85 (1957)
AERE-NP/M (British)		
74	11-4011	
AERE-NP/R (British)		
1577	11-5489	
1594	11-10172	
1629	11-816	Proc. Phys. Soc. (London) A69, 214-20 (1956)
1666	11-6162	
2043	11-4534	
2076(Rev.)	11-10244	Dep.; $4.05
2096	11-13428	Proc. Phys. Soc. (London) A70, 639-53 (1957)
2104	11-11357	$0.32
2140	11-9440	Dep.; $0.32
2251	11-13387	Dep.; $0.90
AERE-R/M (British)		
1	11-4071	
2	11-4656	
93	11-4630	Dep.
96	11-4608	Dep.; $0.32
97	11-4657	Dep.; $0.45
98	11-4762	Dep.; $0.32
100	11-7309	Dep.; $0.45
113	11-6520	Dep.
118	11-10780	
125	11-13257	Dep.; $0.32
AERE-R/R (British)		
842(Del.)	11-4658	
1911	11-9116	J. Nuclear Energy 5, No. 1, 4-15(1957)
1919	11-4707	Dep.; $1.08
1936	11-4985	J. Nuclear Energy 4, 133-46(1957)
1943	11-789	Dep.
1949	11-635	Dep.
1977	11-1057	Dep.
1981	11-236	
2036	11-2065	J. Nuclear Energy 3, 70-1(1956)
2051	11-1313	Dep.; $1.80
2108	11-10716	Dep.; $0.81
2112	11-5570	Dep.
2150	11-9465	Dep.; $0.45
2151	11-7321	Dep.; $0.90
2167	11-9466	Dep.

Report	Abstract	Availability
AERE-R/R (British)		
2191	11-12871	Dep.
2192	11-10274	Dep.; $0 30
AERE-RE/M		
2	11-4659	
AERE-RE/R (British)		
1684	11-10715	
AERE-RP/M (British)		
29	11-4535	
40	11-6069	
48	11-4660	
49	11-4661	
53	11-5571	
58	11-4553	
115	11-9430	Dep.; $0.27
AERE-RP/R (British)		
1393	11-10228	
2013	11-5572	Dep.; $0.63
AERE-RS (British)		
L-3A	11-8230	
L-4	11-9467	
R-2092	11-3543	
AERE-T/M (British)		
71	11-7227	
97	11-10245	
133	11-6581	
134	11-10047	
144	11-5959	Dep.
148	11-9384	Dep.; $0.45(OTS)
AERE-T/R (British)		
503	11-4662	
622	11-2885	
630	11-4738	
962	11-4612	
1066	11-10135	
1601	11-6746	
2077	11-6130	Dep.; $0.90
2138	11-13370	
2210	11-12852	Dep.
2211	11-13487	Dep.; $0.54
AERE-TP/R (British)		
2063	11-3104	Dep.
2174	11-13525	Dep.; $0.45
2175	11-13526	Dep.

Report	Abstract	Availability
AERE-X/M		
169	11-13379	Dep.
AF-SAM		
55-110	11-831	
55-135	11-1394	
56-8	11-2778	
56-51	11-47	
56-59	11-482	
56-60	11-1724	
56-65	11-876	
56-85	11-1395	Radiation Research 6, 111-20(1957)
56-90	11-3648	
56-109	11-6469	
56-111	11-6208	
57-15	11-7908	
57-34	11-11020	
57-36	11-4332	
57-40	11-9398	
57-41	11-11840	
57-42	11-11876	
57-47	11-7909	
57-57	11-12133	
57-67	11-2788	Proc. Soc. Exptl. Biol. Med. 93, 95-6
57-70	11-12808	
57-78	11-10394	
57-79	11-10394	
57-84	11-12640	
57-86	11-10646	
57-89	11-10395	
57-91	11-12641	
57-92	11-12655	
57-102	11-10647	
57-108	11-10396	
57-110	11-13230	
57-119	11-13231	
57-126	11-13232	
AF-TR		
6145(Pt. 3)	11-4817	
AFCRC-TR		
55-172	11-104	See ERI-2228-9-F
AFPTRC-TN		
57-19	11-7048	
AFSWC-TN		
56-2	11-11036	
AFSWC-TR		
56-34	11-12788	

Report	Abstract	Availability
AFSWP		
496	11-4224	
906	11-7359	See USNRDL-TR-135
911	11-1403	See USNRDL-TR-101
1025	11-11024	See USNRDL-TR-142
206716	11-7065	See AD-95491
AGARD		
3	11-1506	
AGC		
1310-2	11-4412	See AGC-AE-30
1310-3	11-6703	
1310-4	11-11160	
AGC-AE		
25	11-1032	
30	11-4412	
ALI-C		
59291	11-5308	
AMRL		
262	11-7919	
271	11-11324	
AMS-MURA		
4	11-3159	See MURA-79
APAE-Memo		
31	11-2100	
37	11-2101	
44	11-11183	
APDA		
107	11-10276	Superseded in part by APDA-115 $3.25(OTS)
ARC		
302(Suppl. 1)	11-6691	See AD-113849
3694	11-169	See AD-89451
3694(Suppl. 1)	11-170	See AD-93436
ARDE(M) (British)		
2/56	11-483	
ARE		
50/54	11-4449	
ARL/MET		
13	11-6735	
ASAE		
9	11-6524	
23	11-12853	
ATI		
37462	11-4225	
122296	11-307	See CAL-39
158256	11-1034	See CAL-HF-710-D-10
ATI		
166839	11-11247	
183485	11-1038	See PDGW-EMR 52/2
AWRE-O (British)		
4/57	11-7108	
39/56	11-5210	
AWRE/Trans (British)		
1	11-5495	
B		
1	11-6682	See NP-6276
2	11-6905	See NP-6277
3	11-6906	See NP-6278
5	11-6815	See NP-6279
1241	11-6963	See NP-6280
1242	11-6816	See NP-6281
1243	11-6817	See NP-6282
BCM/WP		
2	11-6525	
BM-B		
561	11-5331	GPO $1.00
BM-IC		
7766	11-3819	
7771	11-6736	
BM-RI (Misc)		
3722	11-10551	
5239	11-181	
5282	11-3695	
5299	11-7185	
5311	11-4872	
5315	11-4873	
5316	11-13335	
BMI		
1116	11-5834	
1160	11-5309	
1163	11-6325	
BMI-ACRS		
601(Rev.)	11-4076	
BRL		
1010	11-10635	
1011	11-6889	
1026	11-455	
BW		
395	11-12740	
5356	11-12730	
5421	11-3780	

Report	Abstract	Availability
BWR		
3(Del.)	11-4077	
CAL		
39	11-307	
CAL-HF		
710-D-10	11-1034	
CCC		
1024-TR-205	11-103	
1024-TR-206	11-955	
1024-TR-209	11-3326	
1024-TR-211	11-3337	
1024-TR-212	11-3338	
1024-TR-213	11-3327	
1024-TR-218	11-3681	
1024-TR-219	11-4379	
1024-TR-220	11-4380	
1024-TR-221	11-4285	
1024-TR-222	11-7087	
1024-TR-223	11-4820	
1024-TR-226	11-5211	
1024-TR-227	11-5188	
1024-TR-228	11-5776	
1024-TR-229	11-6253	
1024-TR-230	11-5777	
1024-TR-231	11-5761	
1024-TR-232	11-6655	
1024-TR-233	11-6231	
1024-TR-234	11-6232	
1024-TR-235	11-6233	
1024-TR-238	11-7930	
1024-TR-239	11-7943	
1024-TR-240	11-8819	
1024-TR-243	11-11078	
1024-TR-252	11-11079	
1024-TR-256	11-11080	
CEA		
379	11-1717	
418	11-1520	
455	11-48	
484	11-283	
497	11-66	
498	11-1081	
519	11-6010	
523	11-5778	
527	11-5962	
543	11-6556	
545	11-6416	
551	11-6439	
555	11-6440	
556	11-6353	
560	11-6346	

Report	Abstract	Availability
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587	11-6470	
589	11-11051	
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599	11-6456	
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604	11-13398	Compt. rend. 243, 1019-20(1956)
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626	11-4943	J. Nuclear Energy 4, 26-32(1957)
627	11-4121	Nuclear Phys. 2, 593-618(1956-57)
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629	11-4122	Nuclear Phys. 2, 619-23(1956-57)
632	11-13399	Compt. rend. 244, 47-9(1957)
637	11-3799	Intern. J. Appl. Radiation Isotopes 1, 276-83(1957)
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672	11-13562	
CEI (Canadian)		
79	11-6890	Dep.; $3.50(AECL)
CERN		
56-21	11-1356	
56-31	11-4561	
57-2	11-527	Phys. Rev. 103, 1828-36(1956)
57-4	11-1262	Proc. Phys. Soc. (London) A69, 691-704 (1956)
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57-7	11-3199	Proc. Phys. Soc. (London) A69, 798-803 (1956)
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52	11-6442	
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54	11-9371	
56	11-11403	
57	11-13388	
CM		
880	11-7237	
CR-MET (Canadian)		
683	11-5879	Dep.; $0.50(AECL)
700	11-12731	
702	11-10225	Paper #UNESCO/NR/RIC 216, London, Pergamon Press, Ltd., 1957. 8p. Dep.; $0.50(AECL)
CRB (Canadian)		
717	11-12635	Dep.
CRC (Canadian)		
633	11-5534	See TNCC(Can)-4
688	11-5255	
689	11-5172	
693	11-7958	Dep.; $1.00(AECL)
694	11-10685	Dep.; $0.50(AECL)
696	11-11404	Dep.; $1.00(AECL)
713	11-11947	Dep.; $0.50 (AECL)
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591	11-5827	
676	11-5817	Dep.; $1.00
CRDC (Canadian)		
614	11-6680	Dep.; $0.50(AECL)
630	11-7141	Dep.; $1.00(AECL)
645	11-1864	Dep.
646	11-2899	Dep.; $1.00(AECL)
647	11-12882	Dep.; $0.50(AECL)
653	11-4165	Dep.; $1.00(AECL)
687	11-6681	Dep.; $0.20(AECL)
704	11-13266	Dep.; $0.50(AECL)
CRE (Canadian)		
678	11-5016	Dep.; $1.50(AECL)
707	11-10726	Dep.; $1.50(AECL)
CREL (Canadian)		
605	11-6814	Dep.; $1.00(AECL)
675	11-2961	Dep.; $0.50(AECL)
698	11-9473	
CRHP (Canadian)		
677	11-3548	Dep.; $1.00(AECL)
692	11-10072	Dep.; $0.50(AECL)
709	11-11148	
CRIO (Canadian)		
684	11-5017	Dep.; $1.00(AECL)
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41	11-11273	Dep.; $2.00(AECL)
42	11-9401	Dep.; $0.50(AECL)
43	11-11248	Dep.; $2.00(AECL)
44	11-11405	Dep.; $0.50(AECL)
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488	11-4850	
648	11-3375	
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512	11-6078	Dep.; $0.20(AECL)
551	11-6527	Dep.; $1.50(AECL)
558	11-1319	Dep.; $0.50(AECL)
582	11-9100	Dep.
CRP (Canadian)		
615	11-9051	Dep.; $6.00(AECL)
690	11-8138	Dep.; $3.00(AECL)
CRR (Canadian)		
578(Rev.)	11-6893	Dep.; $6.00(AECL)
622(Rev.)	11-11406	Dep.; $1.50(AECL)
644-2	11-7326	
644-5	11-5018	
CRRP (Canadian)		
623	11-593	
659(Add.)	11-6036	Dep.
662	11-3549	Dep.; $0.50(AECL)
667	11-1636	Dep.; $0.50(AECL)
669	11-1320	Dep.; $0.20(AECL)
672	11-6528	Dep.; $1.50(AECL)
680	11-4631	Dep.; $1.00(AECL)
685	11-6079	Dep.; $0.20(AECL)
CRT (Canadian)		
359	11-6529	Dep.; $1.50(AECL)

Report	Abstract	Availability
CRT (Canadian)		
668	11-2976	Dep.
671	11-1231	Dep.
679	11-4613	Phys. Rev. 107, 1028-40(1957)
682	11-10281	Dep.; $2.00(AECL)
715	11-13489	Dep.; $2.00(AECL)
CU (Misc.)		
5-56-SC-64630-Phys.	11-1383	See NP-6143
6-56-SC-64630-Phys.	11-4489	See NP-6200
31-57-AF-677-EE	11-10512	See OSR-TN-57-183
CWLR		
2136	11-11018	
D		
2-1662	11-6149	
2-1819	11-12691	
2-1851	11-7310	
DD		
420-A-39	11-307	See CAL-39
DDC/P (British)		
68	11-11140	See RDB(C)/TN-60
DL (Canadian)		
15	11-5126	Dep.; $0.25(AECL)
28A	11-4779	Dep.; $0.50(AECL)
29	11-5578	Dep.; $0.50(AECL)
DM (Canadian)		
42	11-6894	Dep.; $0.50(AECL)
44	11-11490	Dep.; $0.50(AECL)
DMM-NYU		
197	11-6418	
DOFL-TR		
452	11-12723	
DR (Canadian)		
22(Rev. 2)	11-4681	Dep.; $1.00(AECL)
39	11-3550	Dep.; $1.50(AECL)
DTMB		
797	11-456	
804	11-6417	
1030	11-3551	
1100	11-4930	
1101	11-8169	
DTMB-Trans		
108	11-461	
111	11-446	
DTMB-Trans		
132	11-6424	
E (British)		
443/N-3	11-10738	
443/N-9	11-5579	
443/N-13	11-6080	
443/N-29	11-5580	
443/N-30	11-5581	
443/N-32	11-5582	
443/N-36	11-10282	
EAC-MH/MAC		
1	11-3126	See MURA-35
EES		
030038	11-11161	
040028G	11-3810	
040038B(3)	11-3839	
040028M	11-1865	
ER		
6800	11-13861	See AMF-G-2495
6810(Del.)	11-13862	See AMF-GR-2-54(Del.)
6842	11-4663	See AMF-GR-55
6872(Del.)	11-11741	See AMF-GR-10-55(Del.)
ERG		
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ERI		
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2228-9-F	11-104	
2323-9-F	11-6328	
ESA-MURA		
1	11-3138	See MURA-54
2	11-3142	See MURA-61
3	11-3151	See MURA-70
F-TS		
8407/III	11-3267	See AD-72787
FPS		
20	11-4345	
FPSD/P (British)		
13	11-5818	
20	11-7138	See AERE-ES/R-2089
22	11-12005	See AERE-C/R-2202
FRFEWP		
12	11-4455	SeeLEO/A-28
FSG (British)		
7	11-6081	
22	11-6082	
37	11-6083	

Report	Abstract	Availability
FZK (Non-AEC)		
9-089-2	11-11360	See NARF-55-55T(Vol. 2)
9-113	11-6161	See NARF-57-9T
9-118(Vol. 1)	11-11469	See NARF-57-19T(Vol. 1)
GAT-L (Non-AEC)		
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265(Rev. 1)	11-6974	Rev. Sci. Instr. 28, 274-5(1957)
GNE		
9	11-9000	See USAFIT-TR-57-3
GPI (Canadian)		
36	11-2977	
HARD(A)/N (British)		
20	11-3523	
HARD(A)/P (British)		
25	11-6520	See AERE-R/M-113
HARD(B)/P (British)		
4	11-7978	
24	11-13283	
26	11-5567	See AERE-C/M-298
HARD(C)/P (British)		
20	11-1866	
22	11-13283	See HARD(B)/P-24
41	11-10283	Dep.
HARE		
13	11-13491	
15	11-13355	
HEPL		
33	11-4918	
113	11-2159	Phys. Rev. 105, 1353-5(1957)
HER-H		
4/52	11-7176	
5/52	11-7177	
21/51	11-7178	
IGC-FRDC/P (British)		
217	11-6719	See IGR-TN/W-454
IGC-HRGP/P (British)		
46	11-7123	See IGR-TN/C-540
IGC-SGDC/P (British)		
8	11-6719	IGR-TN/W-454
IGC-SWP/P (British)		
26	11-13554	See IGE/R-3
IGC-TRDC/P (British)		
183	11-1221	See IGR-R/CA-188
IGE/R (British)		
3	11-13554	
IGO-AM (British)		
CA-79	11-5779	
W-62	11-7946	
W-63	11-7947	
W-64	11-4287	
W-68	11-5214	
W-70	11-5215	
W-77	11-8840	
W-78	11-5216	
W-80	11-7111	
W-82	11-6255	
W-83	11-7948	
W-88	11-9226	Dep.(mc)
W-90	11-9227	Dep.(mc)
W-91	11-9228	Dep.(mc)
W-92	11-9998	
W-93	11-9229	Dep.(mc)
W-94	11-9230	Dep.(mc)
W-97	11-10500	
IGR-R/C (British)		
190	11-5333	Dep.
IGR-R/CA (British)		
180	11-1570	
184	11-1058	
188	11-1221	
193	11-3774	
216	11-9210	
IGR-R/R (British)		
197	11-3073	
198	11-3373	
208	11-11413	Dep.
209	11-7327	Dep.
IGR-TN/C (British)		
370	11-311	
540	11-7123	
540(Add.)	11-10458	
569	11-12049	Dep.
651	11-12930	
IGR-TN/CA (British)		
457	11-4833	
484	11-13299	
IGR-TN/D (British)		
443	11-6699	Dep.

Report	Abstract	Availability
IGR-TN/R (British)		
551	11-13302	
641	11-13493	
642	11-13494	
IGR-TN/S (British)		
578	11-12050	
IGR-TN/W (British)		
453	11-4686	Dep.
454	11-6719	
489	11-6783	
500	11-13309	
513	11-8918	
517	11-9268	
IGRL-IB (British)		
CA-23	11-10058	$0.27
R-13	11-12665	
R-17	11-4878	
IGRL-T/C (British)		
24	11-913	Dep.
26	11-1146	Dep.
27	11-1147	Dep.
31	11-4766	Dep.
32	11-9182	Dep.
38	11-4352	Dep.
IGRL-T/C Trans (British)		
25	11-1510	
IGRL-T/CA (British)		
35	11-5770	Dep.
36	11-5257	Dep.
IGRL-T/R (British)		
15	11-657	
21	11-7201	Dep.
22	11-5599	Dep.
IGRL-T/W (British)		
12	11-10514	
17	11-342	
23	11-343	
39	11-10501	
IMP-OSR		
1	11-539	See OSR-TN-56-208
int.-KRS-MURA		
5	11-3125	See MURA-32
IPI (Canadian)		
14	11-3203	

Report	Abstract	Availability
JENER		
44	11-986	
45	11-1477	
46	11-3696	
47	11-11414	
48	11-8867	
49	11-11122	
50	11-12231	
JENER-Pub		
12	11-1980	
13	11-11358	
JPL-Memo		
20-137	11-7163	
JPL-PR		
20-252	11-5857	
26-1	11-273	
26-2	11-1075	
26-4	11-274	
JRL		
23	11-1038	See PDGW-EMR/52/2
KLX		
10043	11-10429	
KMT-MAC		
6	11-3109	See MURA-7
KRS-MURA		
1	11-3122	See MURA-25
2	11-3123	See MURA-26
3	11-2971	See MURA-30
4	11-3124	See MURA-31
LEO/A (British)		
28	11-4455	
LEO/N (British)		
25	11-4689	
LFLWP (British)		
6	11-4455	See LEO/A-28
LJL(ISCAR)		
1	11-3118	See MURA-19
LJL-MAC		
2	11-3114	See MURA-14
3	11-3117	See MURA-18
4	11-3118	See MURA-19
LJL-MURA		
5	11-3155	See MURA-75

Report	Abstract	Availability
LM/TAB		
1	11-313	
2	11-1127	
3	11-3845	
4	11-10510	
LMFP/P (British)		
4	11-4069	See AERE-M/M-121
5	11-12871	See AERE-R/R-2191(Rev.)
9	11-5880	
LMFR/P (British)		
6	11-10274	See AERE R/R 2192
LMFS/N (British)		
4	11-4608	See AERE-R/M-96
LMFS/P (British)		
5	11-4657	See AERE-R/M-97
6	11-4762	See AERE-R/M-98
11	11-5849	
12	11-10780	See AERE-R/M-118
LMFT/P (British)		
11	11-6252	See AERE-C/R-2114
12	11-4283	See AERE-C/R-2115
LWJ-LJL-MAC		
5	11-3108	See MURA-6
M		
332-3	11-1047	See AD-94819
332-4	11-1048	See AD-94820
MAB		
115-M	11-4881	
118-M	11-8901	
119-M	11-11202	
MAC		
1	11-3105	See MURA-2
3	11-3106	See MURA-4
4	11-3107	See MURA-5
8	11-3110	See MURA-9
MAC-DWK		
1	11-3175	See MURA-142
4	11-3115	See MURA-16
5	11-3116	See MURA-17
MAC-JLP		
1	11-3111	See MURA-11
2	11-3112	See MURA-12
3	11-3120	See MURA-21
MAC-LWJ		
1	11-3113	See MURA-13
MAC/LWJ/KMT		
1	11-3119	See MURA-20
MCC		
1023-TR-196	11-77	J. Phys. Chem. 60, 1483-6(1956)
1023-TR-199	11-906	
1023-TR-211	11-3699	
1023-TR-214	11-1857	
1023-TR-226	11-907	
1023-TR-229	11-908	
MD (Canadian)		
207	11-105	
MET		
345-567T3	11-332	See WAL-313/48
345-574T5	11-10566	See Wal-313/48-T5
345-574T6	11-10567	See WAL-313/48-T6
345-574T7	11-10568	See WAL-313/48-T7
365-574	11-12020	See NP-6402
ML		
398	11-11203	
MLCR		
12	11-143	
MP (Canadian)		
6333	11-9212	
MR		
1013	11-4484	See AD-59870
MR-N		
110	11-2161	See NARF-56-40T
111	11-1559	See NARF-56-30T
121	11-3469	See NARF-56-26T
122	11-2180	See NARF-56-27T
122-2	11-2181	See NARF-56-27T(Add. 2)
122-5	11-2182	See NARF-56-27T(Add. 5)
122-9	11-2183	See NARF-56-27T(Add. 9)
127	11-11328	See NARF-57-15T
130	11-5027	See NARF-56-28T
132	11-1946	See NARF-56-39T
137	11-5056	See NARF-57-1T
152	11-8891	See NARF-57-16T
153	11-9157	See NARF-57-17T
156	11-11329	See NARF-57-31T
161	11-11300	See NARF-57-34T
162	11-9431	See NARF-57-21T

Report	Abstract	Availability
MR-N		
168	11-13532	See NARF-57-42T
169	11-10781	See NARF-57-28T
MS-PR		
55-68	11-5881	
MT (Canadian)		
12	11-1267	Dep.; $3.00(AECL)
240	11-3075	Dep.; $0.50(AECL)
241	11-3076	Dep.; $0.50(AECL)
MURA		
2	11-3105	
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11	11-3111	
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35	11-3126	
39	11-3127	
41	11-3128	
42	11-3129	
43	11-3130	
44	11-3131	
45	11-3132	
47(Pts. I and II)	11-3133	
48	11-3134	
49	11-3135	
52	11-3136	
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MURA		
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78	11-3158	
79	11-3159	
80	11-3160	
81	11-3161	
82	11-3162	
83	11-3163	
85	11-3164	
86	11-3165	
88	11-3166	
90	11-3167	
101	11-3168	
104	11-3169	
106(Suppl. 1)	11-4722	
110	11-3170	
142	11-3175	
143	11-3176	
145	11-3177	
147	11-3178	
204	11-3586	
MURA-AMS		
2	11-3156	See MURA-76
3	11-3156	See MURA-76
5	11-3167	See MURA-90
MURA-DBL/RGN/MHR		
1	11-3170	See MURA-110
MURA-DLJ		
1	11-3157	See MURA-77
2	11-3158	See MURA-78
MURA-DWK		
7(Rev.)	11-3143	See MURA-62
9(Rev.)	11-3145	See MURA-64
10	11-3147	See MURA-66
11	11-3152	See MURA-72
12	11-3161	See MURA-81
13	11-3166	See MURA-88

Report	Abstract	Availability
MURA-DWK/KMT/LWJ/KRS		
3	11-3129	See MURA-42
MURA-FTC		
1	11-3141	See MURA-60
2(Pt. B)	11-3148	See MURA-67
MURA-FTC/DWK		
1(Pt. A)	11-3148	See MURA-67
MURA-FTC/ROH/LWJ/DWK/KMT		
1	11-3162	See MURA-82
MURA-JLP		
6	11-3160	See MURA-80
MURA-JMJ		
1	11-3133	See MURA-47(PT. I)
MURA/KMT		
2	11-3140	See MURA-59
MURA-KMT/LWJ/DWK/KRS		
1	11-3128	See MURA-41
MURA-KRS		
6	11-3130	See MURA-43
8	11-3144	See MURA-63
MURA-KRS/AMS		
1(Suppl. 1)	11-4722	See MURA-106(Suppl. 1)
MURA-LDF		
1	11-3164	See MURA-85
MURA-LJL		
6	11-3155	See MURA-75
7	11-3163	See MURA-83
MURA-LWJ		
6	11-3131	See MURA-44
7 and Suppl.	11-3134	See MURA-48
8	11-3139	See MURA-58
9	11-3146	See MURA-65
10	11-3154	See MURA-74
MURA-LWJ/DWK/LJL/KRS/KMT		
2	11-3132	See MURA-45
MURA-LWJ-KMT		
2	11-3136	See MURA-52
3	11-3137	See MURA-53
4	11-3168	See MURA-101
5	11-3169	See MURA-104
MURA-NCF		
1	11-3150	See MURA-69
MURA-NVN		
1	11-3127	See MURA-39
MURA-NVN		
2	11-3153	See MURA-73
MURA-RW-JLP		
4	11-3135	See MURA-49
5 Pt. II	11-3135	See MURA-49
MURA-TBE/DWK		
1	11-3149	See MURA-68
MURA-TO		
2	11-3165	See MURA-86
NAA-AL		
2064-9	11-4456	
2064-12	11-4457	
2194	11-4458	
NACA		
1243	11-4882	
1283	11-12840	$0.20(GPO)
NACA-RM		
51D23	11-5336	
51D23A	11-5337	
52D03	11-10060	
E-50G21	11-3388	
E-51H23	11-11163	
E-54G22a	11-2963	
NACA-TM		
1183	11-12008	
1314	11-242	
NACA-TN		
1911	11-1065	
3462	11-6376	
3655	11-8894	
3778	11-10517	
3781	11-11150	
3782	11-11151	
3783	11-11152	
3784	11-11153	
3785	11-11154	
3885	11-11428	
3787	11-314	
3828	11-5883	
3842	11-6375	
3866	11-5884	
3889	11-4416	
3894	11-10557	
3932	11-5338	
3934	11-12722	
3972	11-10558	
3976	11-5885	
4000	11-6738	
4003	11-8005	
4009	11-13315	
4049	11-11204	
4074	11-11205	

Report	Abstract	Availability
NAPLES-UK		
6	11-3557	
NARF		
55-55T(Vol. 2)	11-11360	
56-26T	11-3469	
56-27T	11-2180	
56-27T(Add. 2)	11-2181	
56-27T(Add. 5)	11-2182	
56-27T(Add. 9)	11-2183	
56-28T	11-5027	
56-30T	11-1559	
56-39T	11-1946	
56-40T	11-2161	
57-1T	11-5056	
57-9T	11-6161	
57-15T	11-11328	
57-16T	11-8891	
57-17T	11-9157	
57-19T(Vol. 1)	11-11469	
57-19T(Vol. 1)	11-11471	
57-21T	11-9431	
57-28T	11-10781	
57-31T	11-11329	
57-34T	11-11300	
57-42T	11-13532	
56-47T	11-6614	
NAVAER		
07-1-505	11-12667	
NAVEXOS-P		
1248	11-459	
NAVORD		
2007	11-5125	
3461	11-3911	
3605	11-6419	
3901	11-10110	
3948	11-6377	
4237	11-11206	
4286	11-6534	
4381	11-7357	$1.25(OTS)
4470	11-9107	
4542	11-11171	
5009	11-5763	
5326	11-6799	
NBS		
4806	11-1137	See WADC-TR-54-485(Pt. 3)
NBS-C		
577	11-4914	
583	11-11466	$0.35(GPO)

Report	Abstract	Availability
NBTL-P		
243	11-5860	
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663	11-6615	
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242	11-12744	
NMA		
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140	11-3768	
NOLC		
368	11-9985	
NOTS		
627	11-5125	See NAVORD 2007
1064	11-3911	See NAVORD-3461
1345	11-5763	See NAVORD-5009
1574	11-6799	See NAVORD-5326
NP (AEC File No. for Non-AEC Reports)		
4859(Suppl. 9)	11-6748	
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5887(Add. 2)	11-11427	
5997	11-2121	
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6104	11-106	
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6125	11-384	
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6128	11-78	
6129	11-79	
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6131	11-209	
6132	11-227	
6133	11-814	
6134	11-1197	
6135	11-521	
6136	11-65	
6138	11-275	
6137	11-538	
6139	11-239	
6140	11-1178	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
6141	11-1179	
6142	11-1277	
6143	11-1383	
6144	11-909	
6145	11-1180	
6146	11-1201	
6148	11-1037	
6150	11-3008	
6151	11-3440	
6153	11-1508	
6155	11-1920	
6156	11-1850	
6156(Add.)	11-7164	
6157	11-1765	
6160	11-2889	
6161	11-2916	
6162	11-3266	
6163	11-2917	
6166	11-3389	
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6181	11-2919	
6182	11-3940	
6184	11-3422	
6186	11-3792	
6187	11-4015	
6188	11-3793	
6189	11-3890	
6190	11-3758	
6191	11-6545	
6195	11-4488	
6196	11-4504	
6197	11-4614	
6198	11-4378	
6199	11-4226	
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Report	Abstract	Availability
NP (AEC file no. for Non-AEC Reports)		
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6207	11-4490	
6208	11-4432	
6209	11-4407	
6210	11-4570	
6211	11-4491	
6212	11-4461	
6214	11-5421	
6215	11-5422	
6216	11-5423	
6217	11-5390	
6220	11-4920	
6221	11-5051	
6222	11-5052	
6225	11-4824	
6226	11-4975	Notas de Fisica Vol. II, No. 12
6231	11-5310	
6232	11-5190	
6233	11-5298	
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6236	11-5369	
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6246	11-6002	
6247	11-5887	
6250	11-7165	
6252	11-6259	
6253	11-6379	
6254	11-6380	
6255	11-6381	
6256	11-6282	
6257	11-6749	
6258	11-6382	
6259	11-6383	
6260	11-6700	
6261	11-6384	
6262	11-6385	
6263	11-6710	
6264	11-6864	
6265	11-6855	
6266	11-7242	
6268	11-6899	
6269	11-6900	
6270	11-6901	
6271	11-6902	
6272	11-6903	
6275	11-6904	
6276	11-6682	
6277	11-6905	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
6278	11-6906	
6279	11-6815	
6280	11-6963	
6281	11-6816	
6282	11-6817	
6283	11-6865	
6284	11-6739	
6286	11-7194	
6287	11-6784	
6290	11-7088	
6291	11-7195	
6292	11-7196	
6293	11-6740	
6294	11-6866	
6307	11-7089	
6311	11-7330	
6312	11-7985	
6313	11-8075	
6315	11-8190	
6316	11-8006	
6317	11-9053	
6318	11-8806	
6319	11-8025	
6320	11-8007	
6321	11-7906	
6322	11-8215	
6323	11-8991	
6324	11-8920	
6325	11-9161	
6326	11-9146	
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6338	11-10291	
6344	11-10042	
6348	11-11292	
6349	11-11164	
6352	11-11254	
6353	11-11903	
6354	11-11155	
6355	11-11186	
6356	11-11133	
6357	11-11156	
6358	11-11014	
6359	11-11255	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
6360	11-10561	
6361	11-11178	
6362	11-10511	
6363	11-11157	
6364	11-11176	
6365	11-11179	
6366	11-11058	
6367	11-11447	
6368	11-11207	
6369	11-11180	
6370	11-11208	
6371	11-11209	
6372	11-11210	
6373	11-11211	
6376	11-11212	
6377	11-11213	
6379	11-11214	
6380	11-11086	
6384	11-11215	
6385	11-11216	
6386	11-11484	
6387	11-11013	
6388	11-12139	Dep.
6389	11-12177	
6390	11-11217	
6391	11-11472	
6393	11-12053	
6394	11-13246	
6397	11-11958	
6398	11-11841	
6399	11-11918	
6400	11-12068	
6401	11-12798	
6402	11-12020	
6403	11-12054	
6404	11-11256	
6405	11-11473	
6406	11-11959	
6414	11-12896	
6415	11-12745	
6416	11-12746	
6418	11-12686	
6419	11-13358	
6424	11-12668	
6427	11-12843	
6428	11-12897	
6429	11-12669	
6430	11-12692	
6431	11-12693	
6432	11-12733	
6434	11-13339	

Report	Abstract	Availability
NPC (British)		
53/4(AERE)	11-4690	
NPCC/RPWP/P		
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NRC (Canadian)		
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NRDC (British)		
10	11-5533	
22	11-6090	
33	11-10245	See AERE-T/M-97
51	11-4034	
54	11-2058	
NRL		
4711	11-10537	
4746	11-3478	
4753	11-258	
4814	11-487	
4821	11-1344	
4824	11-276	
4833	11-488	
4838	11-1077	
4839	11-317	
4858	11-1921	
4861	11-4883	
4886	11-6210	
4887	11-12069	
4906	11-5888	
4919	11-8922	
4928	11-8008	
4929	11-10538	
4937	11-10772	
4938	11-11919	
4941	11-9027	
4942	11-11172	
4944	11-8960	
4953	11-11334	
4961	11-10562	
4962	11-10771	
5017	11-12652	
NRL-Memo		
438	11-4884	
535	11-4955	
581	11-5311	
NURG-M		
5	11-5587	
6	11-4097	
14	11-4691	
17	11-5912	
18	11-5838	
21	11-5588	
22	11-5839	
50	11-5589	
NURG-M		
51	11-5590	
54	11-13311	
ORO-T		
357	11-8764	
OSR-TN		
55-203	11-3009	
56-69	11-5371	
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57-111	11-11346	
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57-132	11-6168	
57-133	11-6169	
57-150	11-6388	
57-151	11-7976	
57-159	11-12674	
57-183	11-10512	
57-313	11-12070	
OSR-TR		
56-19	11-4782	
56-32	11-1581	
56-54	11-1131	
56-56	11-3876	
56-58	11-6328	See ERI-2323-9-F
57-12	11-4885	
PA-TR		
2371	11-5238	
PB		
121161	11-258	See NRL-4753
121190	11-3342	See WADC-TR-55-421
121300	11-3650	
121302	11-3651	
121784	11-6212	
121851	11-7169	See WADC-TR-56-486
121885	11-11223	See WADC-TR-56-375
121925	11-12643	Dep.; $1.75(OTS)
121941	11-12024	See WADC-TR-55-491(Pt. 2)
121961	11-11023	Dep.; $3.25(OTS)
121962	11-13233	Dep.; $2.00(OTS)
121998	11-11258	Dep.; $3.00(OTS)

Report	Abstract	Availability
PB		
131014	11-7357	See NAVORD-4381
131051	11-11474	See WADC-TN-57-120
PCO/Data		
19	11-4571	
PDGW-EMR		
52/2	11-1038	
POC/Memo		
30	11-10176	
39	11-10149	
PPWPR		
15	11-4693	
PR		
327	11-4824	See NP-6225
PR-P (Canadian)		
30	11-1278	Dep.; $2.00(AECL)
31	11-2027	Dep.
32	11-6494	Dep.; $2.00(AECL)
33	11-9054	Dep.; $2.00 (AECL)
PRL		
5.18	11-910	
5.19	11-4419	
5.20	11-12670	
PWAC		
157	11-1328	
PWP(P) British)		
13A	11-3691	See AERE-C/M-109
R		
52GL-300	11-2890	
256(RAND)	11-11318	
1259	11-7089	See NP-6307
RAE-Lib/Trans (British)		
554	11-5351	
564	11-3722	
571	11-3723	
574	11-3724	
576	11-5854	
RAE-R-MET (British)		
86	11-4826	
87	11-160	
RAE-TN (British)		
GW-434	11-9388	
MET-219	11-277	
MET-235	11-319	
RCSC (British)		
10A	11-5870	

Report	Abstract	Availability
RCTC/P (British)		
30	11-2896	See AERE-C/M-224
33	11-5312	
52	11-6309	See AERE-C/R-1703
RDB(C)/TN (British)		
33	11-11060	
60	11-11140	
RDB(W)/TN (British)		
49	11-6706	
109	11-10443	
RDP (Canadian)		
48	11-6078	See CRNE-512
RIA		
55-3641	11-12694	
RL		
3M-57	11-11109	See WADC-TR-57-255
4M-57	11-11959	See NP-6406
RM		
234(RAND)	11-12135	
1711(RAND)	11-3272	
1724(RAND)	11-6800	
1760 (RAND)	11-4492	
1801 (RAND)	11-4558	
1814(RAND)	11-3077	
1835(RAND)	11-6908	
1844(RAND)	11-9344	
1922(RAND)	11-13359	
RMI		
073-Q3	11-12712	
RPI (Canadian)		
12(AECL)	11-12899	Dep.
S		
5185	11-921	See AD-95183
13711	11-6282	See NP-6256
13715	11-6710	See NP-6263
13721	11-11157	See NP-6363
13722	11-9211	See NP-6332
13724	11-11156	See NP-6357
13727	11-11958	See NP-6397
13730	11-12668	See NP-6424
SCEL-TM		
1707	11-734	
SCW		
1	11-3107	See MURA-5
SGP/P (British)		
8	11-9466	See AERE-R/R-2167

Report	Abstract	Availability
SR		
454/56	11-3758	See NP-6190
13534-9	11-1037	See NP-6148
SUI		
54-11	11-3133	See MURA-47(Pt. I)
55-2	11-3133	See MURA-47(Pt. II)
SWP/P (British)		
3	11-6573	
17	11-4753	
23	11-7367	
27	11-8176	
28	11-9046	
40	11-9430	See AERE-RP/M-115
T		
4(RAND)	11-11168	
19/B	11-10512	See OSR-TN-57-183
42((Pt. II(RAND))	11-822	
53(RAND)	11-8895	
58(RAND)	11-823	
TAM		
105	11-320	
TIB/T (British)		
4496	11-5352	JCL
4499A	11-933	JCL
4499B	11-113	JCL
4520	11-5372	JCL
4535	11-462	JCL
TML		
36	11-1134	
39(Suppl.)	11-1883	
46A	11-5343	
53	11-321	
55	11-322	
56	11-1135	
57	11-1869	
60	11-2923	
62	11-3848	
63	11-4465	
69	11-7199	
70	11-10518	
72	11-8923	
73	11-12056	
76	11-11219	
77	11-12747	
78	11-13341	
79	11-12748	
TNCC(Can) (Canadian)		
4	11-5534	
7	11-4631	See CRRP-680

Report	Abstract	Availability
TNCC(UK) (British)		
9	11-10244	See AERE-NP/R-2076(Rev.)
TP (British)		
11	11-10450	
12	11-10451	
13	11-10452	
TIL/T (British)		
4601	11-3364	JCL
4630	11-971	JCL
TPI (Canadian)		
68	11-4554	Dep.; $1.00(AECL)
87	11-13444	
TR (Canadian)		
134/56	11-1508	See NP-6153
143/57	11-11176	See NP-6364
TT (Canadian)		
623	11-947	NRC
626	11-1043	NRC
639	11-1421	NRC
640	11-1148	NRC
650	11-6714	NRC
654	11-6971	NRC
660	11-11265	JCL
U		
20123	11-9389	
25934	11-143	See MLCR-12
UK/C (British)		
4/113	11-5291	
5/5	11-5597	
5/6	11-4764	
5/11	11-5598	
5/19	11-6318	
5/103	11-13506	
USAFIT-TR		
57-3	11-9000	
USNRDL (Non-Project)		
456	11-8982	
USNRDL-TR		
77	11-53	ARCH. Ind. Health 14, 333-40(1956)
101	11-1403	
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114	11-2780	Radiation Research 7, 508-17(1957)
115	11-3481	
116	11-2776	

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USNRDL-TR		
117	11-3702	
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119	11-3675	Proc. Soc. Exptl. Biol. Med. 95, 451-4 (1957)
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134	11-8973	
135	11-7359	
139	11-8794	
141	11-10398	
142	11-11024	
143	11-8766	
145	11-11077	
147	11-10650	
149	11-11087	
154	11-11330	
157	11-11104	
158	11-13228	
159	11-11260	
163	11-13282	
UTIA		
41	11-11165	
UV-ORL		
55-P3-TR-1	11-335	See WAL-691.1/44
WADC-TN		
55-181	11-6675	
55-290(Pt. 2)	11-5890	
55-393	11-3958	
55-639	11-3205	
55-686	11-964	
56-40	11-255	
56-115	11-3597	
56-191(Pt.1)	11-12812	
57-117	11-6944	
57-120	11-11474	Dep.; $0.50(OTS)
57-231	11-11224	
WADC-TR		
53-24(Pt. 1)	11-1136	
53-24(Pt. 2)	11-323	
53-24(Pt. 4)	11-11220	
53-133(Pt. 3)	11-1413	
53-133(Pt. 3, Suppl. 1)	11-1414	
53-190(Pt. 4)	11-324	
53-193(Pt. 2)	11-11181	
53-230(Pt. 3)	11-6391	

Report	Abstract	Availability
WADC-TR		
53-426(Pt. 4)	11-3369	
53-466(Pt. 2)	11-7981	
53-471	11-4493	
54-17(Pt. 3)	11-4466	
54-98(Pt. 2)	11-6701	
54-98(Pt. 3)	11-5853	
54-100(Pt. 2)	11-1039	
54-214(Pt. 1)	11-3849	
54-270(Pt. 2)	11-1051	
54-292(Pt.3)	11-12749	
54-355(Pt. 3)	11-3850	
54-384(Pt. 1)	11-325	
54-384(Pt. 2)	11-326	
54-409(Pt. 1)	11-8974	
54-409(Pt. 2)	11-9345	
54-451(Pt. 1)	11-3385	
54-451(Pt. 2)	11-3386	
54-464(Pt. 4)	11-11088	
54-485(Pt. 3)	11-1137	
54-531	11-1052	
54-532(Pt. 3)	11-3370	
54-616(Pt. 2)	11-1432	
54-616(Pt. 3)	11-2924	
55-30(Pt. 5)	11-8826	
55-58(Pt. 3)	11-7360	
55-86(Pt. 1)	11-1053	
55-102(Pt. 3)	11-1184	
55-199(Pt. 1)	11-2925	
55-199(Pt. 2)	11-3851	
55-207	11-11221	
55-325(Pt. 2)	11-1138	
55-421	11-3342	
55-422(Pt. 1)	11-5840	
55-454(Pt. 2)	11-1526	
55-458(Pt. 2)	11-5344	
55-470(Pt. 2)	11-2901	
55-473	11-260	
55-491	11-1514	
55-491(Pt. 2)	11-12024	Dep.; $2.00(OTS)
55-495(Pt. 1)	11-1527	
55-495(Pt. 2)	11-5891	
55-495(Pt. 3)	11-2937	
55-496	11-327	
55-510	11-328	
56-4(Pt. 2)	11-3721	
56-37	11-5345	
56-85	11-5307	
56-88	11-3429	
56-137	11-6347	
56-139	11-4856	
56-140	11-4857	
56-178	11-8076	

Report	Abstract	Availability
WADC-TR		
56-181	11-3852	
56-220	11-5346	
56-222(Pt. 1)	11-6421	
56-237	11-5861	
56-242	11-329	
56-250	11-1515	
56-267	11-6321	
56-269	11-3853	
56-273	11-4222	
56-296	11-4741	
56-300	11-3703	
56-304	11-5347	
56-318	11-80	
56-319	11-11222	
56-327	11-1139	
56-329	11-7180	
56-343	11-330	
56-359	11-5360	J. Metals 9, 349-57(1957)
56-370(Pt. 2)	11-4420	
56-372	11-5892	J. Am. Ceram. Soc. 40, 363-73(1957)
56-374(Pt. 1)	11-4888	
56-375	11-11223	Dep.; $0.50(OTS)
56-376	11-9985	See NOLC-368
56-399	11-81	
56-409	11-5893	
56-411	11-5894	
56-421	11-1140	
56-423	11-331	
56-430(Pt. 1)	11-4851	
56-433	11-5733	
56-440	11-10521	
56-452	11-10588	
56-453	11-6742	
56-454	11-5348	
56-455	11-11089	
56-456	11-5349	
56-462	11-10429	See KLX-10043
56-465	11-10465	
56-467	11-4742	
56-469	11-4467	J. Metals 9, 1227-35(1957)
56-481	11-8924	
56-486	11-7169	Dep.; $4.00(OTS)
56-521	11-8009	
56-534(Pt. 2)	11-8857	
56-534(Pt. 3)	11-11108	
56-540	11-12687	
56-545	11-5895	
56-548	11-10177	
56-550	11-8010	
56-557(Pt. 1)	11-6150	
56-579	11-5896	
56-580	11-6392	
56-597	11-6743	
56-657	11-10651	
56-663	11-5302	
57-11	11-4381	
57-30	11-5897	
57-32	11-8908	
57-39	11-10523	
57-40	11-8011	
57-86	11-10524	
57-89	11-5490	
57-110	11-7092	
57-141	11-13284	
57-154	11-8925	
57-177	11-11158	
57-251(Pt. 1)	11-13342	
57-255	11-11109	
57-297	11-10519	
57-298(Pt. 1)	11-13343	
57-298(Pt. 2)	11-13344	
57-298(Pt. 3)	11-13345	
WAL		
132/24	11-10091	
313/48	11-332	
313/48-T5	11-10566	
313/48-T6	11-10567	
313/48-T7	11-10568	
372/19	11-4545	
397/9	11-5765	
401/65-39	11-10092	
401/79-33	11-6393	
401/85-32	11-4468	
401/93-37	11-12750	
401/97-35	11-333	
401/203-7	11-1884	
401/204-5	11-1885	
401/230-1	11-1886	
401/250	11-1528	Welding J. (N. Y.) 36, 185s-91s(1957)
401/267	11-334	
401/267-1	11-13346	
401/268	11-5350	
401/271	11-12675	
401/272	11-6394	
401/277	11-11225	
401/282	11-13347	
691.1/44	11-335	
710/930-6	11-336	
847/47	11-4469	
WAPD-A1W (PCH)170	11-4267	
WAPD-CTA (EDX)275	11-5303	
WAPD-SFR S-86	11-3080	
WAPD-TM		
32	11-10299	
59	11-10641	
WCRT-TN		
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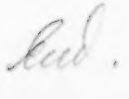

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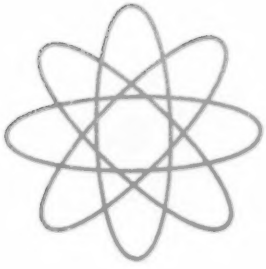

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U of M Bindery FEB 6 '56

NEW NUCLEAR DATA

Compiled by the Nuclear Data Group, National Research Council
Washington 25, D. C.

M. Yamada, editor; G. H. Fuller, D. N. Kundu, J. B. Marion,
C. L. McGinnis, and K. Way

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Table 1. Radioactivity, Levels, Abundances, Moments
Table 2. Neutron Cross Sections
Table 3. Ground State Q's
Table 4. Mass Differences
Table 5. Nuclear Spins and Moments
Table 6. Elastic and Inelastic Scattering of Charged Particles

INTRODUCTION

This booklet, New Nuclear Data, 1957 Cumulation, contains the sixth annual cumulation of new nuclear data. The results collected here have been taken from journals which have become available from about November 1956 to August 1957. As is shown by the list of journals abstracted, which is given below, the coverage in this cumulation begins where it left off for the 1956 compilation.

Earlier 1957 nuclear-data summaries have

U of M Bindery FEB 6 '59 (B)

been published in Nuclear Science Abstracts, Volume 11, No. 6B(March 31) and No. 12B(June 30, semiannual cumulation). These summaries, together with the material which has come to hand since 12B was prepared, are included in the present booklet.

The 1952, 1953, 1954, 1955 and 1956 annual cumulations are contained in issues 24B of Vols. 6, 7, 8, 9 and 10 respectively. The supply of extra copies for 1952, 1953, 1954 and 1955 is exhausted; for 1956 a few copies are obtainable for $0.60 from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Remittance should be by check or money order. Add 25% for foreign postage.

The present cumulation contains for the first time a separate list, Table 6, of the data on the Elastic and Inelastic Scattering of Charged Particles. This table covers not only new 1957 data but all experimental results in this field which have appeared since 1950. In some cases there is overlapping with material which has been included in various years in Table 1 on Radioactivity, Levels, Abundances, Moments. However, much of the information concerns chiefly the reaction mechanism, rather than level properties, and so could not be fitted into the framework of this table. A new approach has therefore been adopted and extended somewhat into the past in order to present a fairly complete picture.

Neutron Cross Sections and Mass Differences which are given in Tables 2 and 4 are not included in Table 1. Ground State Q's are given in Table 1 when they are reported in a paper dealing with level properties. However, for complete information on new measurements of ground state Q's, the reader should consult Table 3. Although data on Nuclear Spins and Moments are included in Table 1, they have been made into a separate collection, Table 5, for the benefit of those particularly interested in the field of moments.

Nuclear Level Schemes: The first section of a new comprehensive nuclear data table prepared by the Nuclear Data Group was published late in 1955 by the Government Printing Office. The aim of Nuclear Level Schemes is to provide a revision and expansion of Nuclear Data which was issued in 1950 as Circular 499 of the U. S. National Bureau of Standards. It will be published in five or six sections, each one of which will be issued upon completion. The first section gives the data for known nuclei with mass numbers between A = 40 and A = 92, thus covering roughly the elements $_{20}$Ca through $_{40}$Zr. The second section covering A = 93 to A = 150 will be issued early in 1958.

Nuclear Level Schemes (A = 40 to A = 92), TID-5300, can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price $1.75, 240 pages paperbound. Remittance should be by check or money order. Add 25% for foreign postage.

Nuclear Data Sheets: From 1954 through 1957 new nuclear data have been presented in a systematic way on Nuclear Data Cards. These 3- by 5-inch cards have been issued monthly to subscribers in sets of about 150 cards each month. Beginning in January 1958 Nuclear Data Sheets will replace the Nuclear Data Cards. The sheets ($8\frac{1}{2} \times 11$ inches in size) will present the new data from current journals on radioactivity, nuclear energy levels, reactions, moments, etc., just as the cards have done, but will have added to this the old data in the same style as is used in Nuclear Level Schemes. This addition of the previously reported data will be done gradually but as quickly as possible. Eventually each sheet in a monthly set will contain, for a particular nucleus, the new experimental results (marked with arrows), the older data, and all pertinent references. Previous sheets (or cards) for this nucleus can then be discarded. Level schemes for nuclei with the same mass number will be diagrammed together as in Nuclear Level Schemes and revised as often as is necessary.

Nuclear Data Sheets will be issued on stock of two different weights, a light weight paper stock, punched for use in binders, and a heavy weight card stock for drawer filing. Individuals, laboratories, or libraries may subscribe to the Sheets by applying to the Publications Office, National Academy of Sciences-National Research Council, Washington 25, D. C. The subscription charges per year are $15.00 for Sheets on paper stock and $18.00 for Sheets on card stock. Parcel post will be used in the U.S.A., printed matter mail elsewhere.

Nuclear Theory Index Cards: A new 3- by 5-inch card index system for theoretical papers in low energy nuclear physics is being started in January 1958. Each card will contain the title of an article, authors' names and institutional affiliations, number of figures and tables in the paper, and literature reference. Prominent code numbers will show the topic and sub-topic under which the article has been classified. Main topics include Nuclear Structure, Nuclear Reactions, Electromagnetic Radiation, Beta Decay and Parity, Alpha Decay, and Tables and Computational Aids. Examples of the 9 subtopics under Nuclear Reactions are: Statistical Model, Optical Model,

Stripping and Pick-up. More than one card will be issued in case a paper falls into more than one classification.

During 1958 subscribers will receive cards covering papers appearing in both 1957 and 1958 (about 700 cards). The subscription price for the 1957-58 sets is $5.00. First class mail will be used in the U.S.A., printed-matter mail elsewhere. Orders for subscriptions should be sent to the Publications Office, National Academy of Sciences-National Research Council, Washington 25, D. C.

NUCLEAR DATA STATISTICS

Just below some numbers are given to show the amount of new nuclear data in 1957 compared to that in previous years. The periods referred to as 1956, 1957, etc. are twelve month periods beginning each year at about Oct. 1st. By an "item" is meant the information on a particular nucleus given with its reference in the main section. Table 1, of the cumulation which covers Radioactivity, Levels, Abundances, Moments.

	Number of Items on Radioactivity etc.	Number of Cross Sections	Number of Ground State Q's	Number of Mass Differences	Number of Nuclear Moments	Number of New Nuclei Reported	Total Pages
1952*	1186	264	205	139	99		52
1953	1026	562	140	133	60		74
1954	1328	308	107	112	79		99
1955	1581	425	107	18	84	67	141
1956	1534	433	133	106	75	39	144
1957	1559	492	76	88	80	48	167

* 15 months.

CONVENTIONS

All energies are given in Mev and all cross sections in barns unless otherwise stated in the tabular material.

Numerals in italics, following measured values, are the errors (as reported by the authors) in the last figure of the values. In cases where confusion seems possible, the conventional ± is used.

Magnetic moments are reported as before without diamagnetic correction. They are based on $\mu(H) = 2.79267$ and the substandards listed by H. Walchli, ORNL-1469.

In writing reactions, the upper right hand superscript denoting A, the mass number of the target nucleus, is given without parentheses when the target was monoisotopic or when enriched (or depleted) material was used to establish the identity of the reacting isotope. It is given in parentheses when natural material was used and when the identity of the reacting isotope was strongly suggested by its predominating abundance, the observed reaction energy, or the activity or yield of the end product. It is given in parentheses with a question mark when the target A was assigned by systematics, elimination, etc. For instance, "B^{10}(d,p)" means that the proton groups from the deuteron bombardment of B^{10} were identified by comparing effects in B^{10} enriched and natural B samples. "B^{11}(d,p)" means that the assignment to B^{11} was made by using B^{11} depleted and natural B samples. "$C^{(12)}$(d,p)" means that natural C was used to study the reaction, but, because of the 99% abundance of C^{12}, the reaction observed was assumed to take place in that isotope. In the reaction "$Sn^{(116)}$(n,p)13^{s}In," the Sn isotope was identified by the In product. "$Te^{(125?)}$(d,p)$Te^{(126?)}$" indicates that from the trend of Q values in the region, the experimenters believed that their measured Q most likely belonged to the indicated reaction.

When a method of production of a radioactive nucleus is given, the lowest bombarding energy used by the experimenter is indicated; e.g., Ag(20-Mev p,n).

The large black dots on the decay schemes are used to indicate experimentally established coincidences. α, β, or γ rays entering a level and dotted at their arrowheads have been shown to be in coincidence with gamma rays leaving the same level and dotted at their origins. In case of a simple cascade, the dots of the incoming and outgoing rays are superimposed. Dashes are used for doubtful radiations or levels.

For the light nuclei, energy levels in the compound nucleus are usually tabulated rather than the resonant energy of the bombarding particle. The binding energy of the bombarding particle in the compound nucleus is taken from the table of F. Ajzenberg, T. Lauritsen, Revs. Modern Phys. 27, 77 (1955) for $Z < 11$ or from P. M. Endt, J. C. Kluyver, Revs. Modern Phys. 26, 95 (1954) for $11 \leq Z \leq 20$. For $Z > 20$ the resonant energy is given and the excitation energy of the compound nucleus is computed from the data in one of the following compilations: Nuclear Level Schemes (A = 40 to A = 93) TID-5300; W. H. Johnson, Jr., A. O. Nier, Phys. Rev. 105, 1014 (1957); A. H. Wapstra, Physica 21, 385 (1955); J. R. Huizenga, Physica 21, 410 (1955).

ABBREVIATIONS

$A_1, A_2 \ldots$	Coefficients of Legendre functions in angular correlation measurements
a	absorption
a $\beta\gamma$	absorption of β's in coincidence with γ's
a ce	absorption of conversion electrons
a coin	absorption of photoelectrons between counters in coincidence
act	neutron detection by activation (Mn, Rh, Ag, ...)
α	total γ-ray conversion coefficient, N_e/N_γ
$\alpha_K, \alpha_L, \ldots$	γ-ray conversion coefficient for electrons ejected from the K, L, ... shell
$\alpha_0, \alpha_1, \ldots$	α to g.s., first excited state, ... of residual nucleus
B	band spectra method
B(E2)	reduced E2 excitation probability in barns^2 (upward transition)
Be(γ,n)	measurement by detection of photoneutrons from Be
BF_3	boron trifluoride neutron counter
$\beta\gamma$ ($\uparrow\downarrow$)	polarization-direction correlation of β's and γ's in coincidence
$\beta\gamma(\theta)$	angular correlation of β's and γ's in coincidence
calc	calculated from experimental work reported elsewhere
cc	cloud chamber
CcW	Cockcroft Walton accelerator
ce	conversion electrons
chem	chemical separation of product following reaction
c.m.	center of mass
Cp	Compton
crit a	critical absorption
cryst	crystal spectrometer
cyc	cyclotron
d	(1) deuteron, (2) descendant of, (3) days, when used as superscript
D	average level spacing per spin state
d,p(θ)	angular distribution of protons with respect to deuteron beam
D(γ,n),D(γ,p)	measurement by detection of photoneutrons or photoprotons from deuterium
δ	ratio of reduced matrix elements of (L + 1)- to L-pole radiation with sign convention of Biedenharn and Rose
$\bar{E}$	average energy
E_o	resonance energy
$E_\beta, E_\gamma, \ldots$	energy of β ray, energy of γ ray,
E_{dis}	disintegration energy
EA	electrostatic analyzer
E1,E2, ...	electric dipole, electric quadrupole, ...
E_ϵ	energy of the electron capture transition (end point of γ continuum + K binding energy)
e_A	Auger electron
e_{AK}, e_{AL}	KXY, LXY Auger electron
el	elastic scattering
ϵ	electron capture
ϵB(E2)	partial B(E2) for radiation studied (photon, ce_K, or ce_L)
ϵ_K, ϵ_L	electron capture from K, L shell
$\eta(\theta)$	$[W(\theta) - W(\pi/2)]/W(\pi/2)$, a measure of asymmetry in angular distributions, where $W(\theta)$ is the count at angle θ
f	fission
F-K	Fermi-Kurie plot
ft	comparative half-life in the Fermi theory of β decay calculated for an allowed transition. Superscript 1, 2, or 3 on f indicates that comparative half-life is calculated for a unique 1st, 2nd, or 3rd forbidden transition
g	(1) gyromagnetic ratio (2) statistical weight factor, $\frac{1}{2}[1 \pm 1/(2J + 1)]$, in g Γ_n (3) gram
Γ	resonance half-width (the whole width at half-maximum)
Γ_γ, Γ_n	partial resonance half-width for γ, neutron emission. When used with natural element, they are half-widths for an isotope multiplied by its relative abundance
$\langle \bar{\Gamma}_n^o/D \rangle$	average strength function measured in the kilovolt energy range

Γ_n^o	$\Gamma_n/\sqrt{E_o(ev)}$
γ^+	annihilation radiation
γ continuum	continuous γ spectrum associated with electron capture
$\gamma(Hg^{198})$	γ is emitted from nucleus in parentheses rather than from radioactive parent
$\gamma(\theta,T)$	γ intensity as function of angle and temperature
$\gamma\gamma$, $\beta\gamma$, $\alpha\gamma$, $n\gamma$	$\gamma\gamma$, $\beta\gamma$, $\alpha\gamma$, or $n\gamma$ concidences. (0.123 γ)(0.246 γ, 0.325 γ) means 0.123 γ in coincidence with 0.246 γ and 0.325 γ
$\gamma\gamma(\theta)$	angular correlation of γ's in coincidence
$\gamma\gamma(\perp)$	polarization-direction correlation of γ's in coincidence
GM	Geiger-Müller counter
g.s.	ground state
h	hours
H	magnetic field
I	nuclear induction method
IB	internal bremsstrahlung
ic	ionization chamber
IT	isomeric transition
J	spin in units $h/2\pi$
K/L, K/LM	α_K/α_L, $\alpha_K/(\alpha_L+\alpha_M)$
L_1L_2/L_3	$(\alpha_{L_1}+\alpha_{L_2})/\alpha_{L_3}$
l	orbital angular momentum
lin	linear accelerator
m	(1) medium intensity, (2) minutes, when used as a superscript
M	molecular or atomic beam resonance method
M1,M2, ...	magnetic dipole, magnetic quadrupole, ...
mb	millibarns
Mev	million electron volts (10^6 ev)
mev	millielectron volts (10^{-3} ev)
Mic	microwave method
mir	measurement by total reflection of neutron beam from mirror surface
mod cyc	modulated cyclotron
ms	(1) milliseconds, 10^{-3}s (2) mass spectrometer
mμs	millimicroseconds, 10^{-9}s
μ	nuclear magnetic moment (nuclear magnetons)
μ_3	nuclear magnetic octupole moment (nuclear magneton barns)
μs	microseconds, 10^{-6}s
$\mu\mu$s	micromicroseconds, 10^{-12}s
n res	known resonance of a "standard" element used to identify an unknown neutron energy
ν	neutrino
osc	pile oscillator method
θ^2	reduced level width in units of $3h^2/8\pi^2MR$
p	(1) proton, (2) predecessor of
P,P_1,P_2	polarization along the direction of $V_i \times V_0$ where V_i and V_0 are velocities of incoming and outgoing particles. Subscripts refer to first and second scatterings (or reactions) in double scattering experiment
para	paramagnetic resonance method
parentheses	parentheses are put around values which are given for identification purposes
pc	proportional counter
pe	photoelectrons
ppl	photoplates or emulsions
pr	electron-positron pair
p res	proton resonance. Magnetic field standardized by means of proton resonance frequency
primes	primes indicate inelastically scattered particles
q	electric quadrupole moment in units of barns
quad res	quadrupole resonance method
q_4	nuclear electric 16-pole moment in units of 10^{-48} cm^4
Q	reaction energy in Mev
R	nuclear radius in fermis (10^{-13} cm)
s	(1) magnetic spectrometer method, (2) seconds, when used as superscript
s coh	coherent scattering
S	(1) atomic spectrum measurement (2) channel spin
scin	1-crystal scintillation counter
scin Cp	2-crystal scintillation counter
scin pr	3-crystal scintillation counter
sd	double focusing spectrometer
sl	lens spectrometer
sl ce	conversion electrons measured in lens spectrometer
S_n,S_p	energy necessary to separate neutron, proton from nucleus
sr	steradian
st	strong
sπ	180° spectrometer
sπ pr	180° pair spectrometer
σ	cross section in barns

σ_o	cross section at resonance energy, E_o
Σpc	proportional counter used to sum energy of transitions in cascade
Σscin	scintillation counter used to sum energy of transitions in cascade
t	(1) triton, H^3
T	(1) isotopic spin, (2) temperature
τ	half life in units indicated
τ_1, τ_2	half life of upper, lower state
$\tau_{\beta\beta}, \tau_{\epsilon\epsilon}$	half life for double β, double ϵ decay
th	thermal
thresh	threshold
trans	transmission
VdG	Van de Graaff accelerator
w,vw	weak, very weak
ω_K, ω_L	K, L fluorescence yield
x	x radiation
y	years
$Y_\gamma, Y_p, \ldots$	yield of γ rays, yield of protons, ...
%	number per 100 disintegrations. For γ's, total number of photons plus ce's is meant
†	number relative to other numbers marked †. For γ's, number of photons only is meant
+,−	even, odd parity when used in connection with level properties
⊥	polarization direction

Standard journal abbreviations are used.

LIST OF JOURNALS SURVEYED FOR NEW NUCLEAR DATA, 1957 CUMULATION

Numbers following a colon are issue numbers, other numbers (except years) are volume numbers. All numbers are inclusive.

Acta Phys. Hung. 6: 2-4(1956); 7: 1-3(1957).
Acta Phys. Austriaca 10: 2-4(1957); 11: 1-2(1957).
Acta Phys. Polon. 14: 3-6(1955); 15(1956); 16: 1-4(1957).
Ann. phys. 1: July-Dec.(1956); 2: Jan.-Feb.(1957).
Ann. Physik 18: 5-8; 19(1956); 20: 1-6(1957).
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Australian J. Phys. 9: 3-4(1956); 10: 1(1957).
Bull. Am. Phys. Soc. 1: 7-8(1956); 2: 1-5(1957).
Bull. Inst. Nuclear Sci. Boris Kidrich 7(1957).
Bull. Research Council Israel 5A: 4(1956); 6A: 1-4(1956-57).
Can. J. Chem. 34: 10-12(1956); 35: 1-8(1957).
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Compt. rend. 243: 18-25(1956); 244; 245: 1-16 (1957).
Current Sci. 25: 10-12(1956); 26: 1-9(1957).
Czechoslov. J. Phys. 6: 4-6(1956); 7: 1-4(1957).
Doklady Akad. Nauk SSSR 106; 107; 108; 109; 110 (1956).
Helv. Phys. Acta 29: 3-6(1956); 30: 1-3(1957).
Indian J. Phys. 30: 5-12(1956); 31: 1-5(1957).
Izvest. Akad. Nauk SSSR, Ser. Fiz., 19: 3-6(1955); 20: 1-7(1956).
J. Am. Chem. Soc. 79: 21-24(1956); 80: 1-16 (1957).
J. Chem. Phys. 25: 3-6(1956); 26(1957).
J. Franklin Inst. 260: 3-6(1955); 261; 262(1956); 263; 264: 1-5(1957).
J. Inorg. Nuclear Chem. 3(1956); 4(1957).
J. Nuclear Energy 3(1956); 4(1957).
J. Phys. Chem. 10-12(1956); 11: 1-7(1957).
J. phys. radium 17: 10-12(1956); 18: 1-4(1957).
J. Phys. Soc. Japan 11: 9-12(1956); 12: 1-9(1957).
J. Research Nat. Bur. Standards 57: 5-6(1956); 58; 59: 1-5(1957).
Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd., 30: 17-22(1956); 31: 1-5(1957).
Nature 178: 4539-4548(1956); 179; 180: 4575-4590 (1957).
Naturwiss. 43: 21-24(1956); 44: 1-16(1957).
Nuclear Phys. 1: 9(1956); 2; 3; 4: 1-2(1957).
Nuclear Sci. Eng. 1: 6(1956); 2: 1-5(1957).
Nuovo Cim. 4(1956); 5: 1-4(1957).
Phil. Mag. 1: 9-12(1956); 2: 13-19(1957).
Physica 22: 10-12(1956); 23: 1-7(1957).
Phys. Rev. 103: 5-6; 104(1956); 105; 106; 107: 1-2(1957).
Proc. Indian Acad. Sci. 44(1956); 45: 1-5(1957).
Proc. Phys. Soc. 69A: 439-444(1956); 70A: 445-452(1957).
Proc. Roy. Soc. 237A(1956); 238A-241A(1957).
Rev. Mexicana Fis. 5: 3-4(1956); 6: 1-2(1957).
Zhur. Eksptl.' i Teoret. Fiz. 29(1955); 30; 31 (1956).
Z. Naturf. 11a: 10-12(1956); 12a: 1-8(1957).
Z. Phys. 145: 5; 146(1956); 147; 148(1957).

For information on reports and occasional papers in journals other than the above, Nuclear Science Abstracts, Chemical Abstracts, and Physics Abstracts are surveyed.

1. RADIOACTIVITY, LEVELS, ABUNDANCES, MOMENTS

?

Tracks (range > 100μ, not electrons) observed in ppl exposed to Pb^{210}(β^- emitter). Similar tracks found with Po, Th, Ac, Ra, Pu, and U

56A47 M.Ader, M.P.Cabannes, J. phys. radium 17, 1023 (1956).

ν

μ $< 10^{-9}$ Bohr magneton
from counting rate of 0.1- to 0.5-Mev electrons in liquid scin near reactor

57C61 C.L.Cowan,Jr., F.Reines, Phys. Rev. 107, 528 (1957).

n^1 0 1 12^m

polarized n
$\beta^-(\theta) = 1 - (0.37\ 11) < J_Z/J > < v/c > \cos\theta$

57B151 M.T.Burgy, R.J.Epstein, V.E.Krohn, T.B.Novey, S.Raboy, G.R.Ringo, V.L.Telegdi, Phys. Rev. 107, 1731 (1957).

n^1 0 1

μ -1.913148 *66* M
$\nu_n/\nu_p = 0.685057$ *17*

56C57 V.W.Cohen, N.R.Corngold, N.F.Ramsey, Phys. Rev. 104, 283 (1956); Bull. Am. Phys. Soc. 1, No. 1, 11 B7 (1956).

Charge $< 2\times10^{-15}$ electron charges
From non-deflection of CsI molecular beam in electric field assuming electron and proton charges are exactly equal

57H81 V.W.Hughes, Phys. Rev. 105, 170 (1957).

Charge $< 6\times10^{-12}$ electron charges
From non-deflection of thermal neutron beam in electric field

56S122 I.S.Shapiro, I.V.Estulin, Zhur. Eksptl'n. i Teoret. Fiz. 30, 579 (1956); Soviet Phys. JETP 3, 626 (1956).

n^2 0 2

$H^3(d,2n)He^3$ E_d = 12, 14; ppl
He^3 energy distributions do not agree well with three-body process but show no evidence for bound or virtual level ($\Gamma < 0.5$) in n^2

57R50 L.Rosen, J.E.Brolley,Jr., W.S.Hall, Bull. Am. Phys. Soc. 2, No. 4, 208 P7 (1957).

n^2 0 2

$H^3(t,n^2)$ E_t = 1.48
No evidence for n^2 p-recoil s, 0°
Produced in < 5% of H^3(t) reactions

57B10 S.J.Rame,Jr., W.T.Leland, Phys. Rev. 106, 1257 (1957); Bull. Am. Phys. Soc. 2, No. 2, 104 J3 (1957).

H^1 1 0

μ +2.79273 4 nuclear magnetons
+0.00152997 *16* Bohr magnetons
Values given without diamagnetic correction
electron-cyclotron method

56F30 P.Franken, S.Liebes,Jr., Phys. Rev. 104, 1197 (1956).

H^3 1 2

No hyperfine structure anomaly within accuracy of present $\mu(H^3)/\mu(H^1)$ measurements M

57P48 A.G.Prodell, P.Kusch, Phys. Rev. 106, 87 (1957).

$H^2(n,n)$ E_n = 2.45, 3.27
n,n(θ) found to be very similar to p,p(θ) at the same incident energy time of flight

57S35 J.D.Seagrave, L.Cranberg, Phys. Rev. 105, 1816 (1957).

He^3 2 1

Ground state
Sign of μ is negative I

57K31 M.P.Klein, B.E.Holder, Phys. Rev. 106, 837 (1957).

Hyperfine structure anomaly of (182 ± 22) ppm observed M

56N25 R.Novick, E.Commins, Phys. Rev. 103, 1897 (1956).

He^4 2 2

Levels $H^5(d,n)$ E_d = 14.4 Cyc
g.s. time-of-flight
22

n spectrum shows peaks at E_n = 30, ~8.5(broad)
Comparison with n spectrum from $He^3(d,n)$, which shows broad peak at E_n ~5.5, suggests that part of ~8.5 broad peak is due to He^4 22-Mev level

56B143 G.F.Bogdanov, N.A.Vlasov, S.P.Kalinin, B.V.Rybakov, V.A.Sidorov, Zhur. Eksptl.' i Teoret. Fiz. 30, 185, 981 (1956); Soviet Phys. JETP 3, 113, 793 (1956); Physica 22, 1150A (1956).

$He^4_{2\ 2}$

Level $He^{(4)}(p,p')$ $E_p = 181$
22.7 4 $\theta = 10°$ to 23°
Peak too broad for ordinary single level

57T27 H.Tyren, G.Tibell, Th. A.J.Moris, Nuclear Phys. 4, 277 (1957).

(1) $H^2(d,n)$ $E_d = 4.75$ to 7.33
(2) $H^2(d,np)$ time-of-flight n
$\sigma_2(0°)$ increases with E_d from 0.24 to 32 mb/sr
$\sigma_2/\sigma_1 = 0.17$ at 0°, $E_d = 6.3$, $E_n > 0.95$
d,n(θ, $E_d = 6.3$) shows strong forward peaking in both reactions

56C68 L.Cranberg, A.H.Armstrong, R.L.Henkel, Phys. Rev. 104, 1639 (1956).

(1) $H^2(d,p)$ $E_d = 6.1$ to 13.8 cyc
$\theta = 14°$ to 130° c.m.
(2) $H^2(d,n)$ $E_d = 5.8$ to 13.8 cyc
$\theta = 23°$ to 110° c.m.
Legendre coefficients determined for $\sigma(\theta)$ for both reactions
$\sigma(0°)$ for (2) increases from ~80 to ~100 mb/sr in above energy range

57B129 J.E.Brolley, Jr., T.M.Putnam, L.Rosen, Phys. Rev. 107, 820 (1957).

Polarization $H^2(d,p) \rightarrow He^4(p,p)$ $E_d = 0.64$
$P_1(45°\text{c.m.}) = -0.17$ 7 thin gas target
when P_2 is calculated from phase shifts

57S40 R.E.Segel, S.S.Hanna, Phys. Rev. 106, 536 (1957).

Polarization $H^2(d,n) \rightarrow C^{(12)}(n,n)$
$P_1(53°\text{c.m.}) = -0.11$ 1 $E_d = 0.60$ to 0.70
When P_2 is calculated from phase shifts
thick ice target

56M70 B.M.McCormac, M.F.Steuer, C.D.Bond, F.L.Hereford, Phys. Rev. 104, 718 (1956).

Polarization $H^2(d,n) \rightarrow He^{(4)}(n,n)$
$E_d = 0.4$ to 1.8
$P_1(49°$ lab.) varies monotonically with E_d pc

57L26 I.I.Levintov, A.V.Miller, E.Z.Tarumov, V.N.Shamshev, Nuclear Phys. 3, 237 (1957).

$He^5_{2\ 3}$

Level $Li^6(t,\alpha)$ $E_t = 0.235$; 89° to 97°
g.s. $Q = +15.15$ 4 $\Gamma = 0.7$ 2

56C47 D.S.Craig, W.G.Cross, R.G.Jarvis, Phys. Rev. 103, 1427 (1956).

Level $He^{(4)}(d,p)$ $E_d = 14.8$
g.s. Γ(c.m.) = 0.55 3 [s + scin
$\sigma(18°) = 25$ 5; $\sigma(24°) = 15$ 4 mb/sr 18° to
$\theta^2 = 0.05$ if $l_n = 1$ 24°
No evidence for 2.6 level but background high

57W01 E.K.Warburton, J.N.McGruer, Phys. Rev. 105, 639 (1957); Bull. Am. Phys. Soc. 1, No. 7, 325 E10 (1956).

Levels $H^3(t,n)$ $E_t = 1.48$
No evidence for 2.6 level p-recoil s, 0°
Excess of intermediate energy n's suggests broad excited state or 3-body disintegration

57B10 S.J.Bame, Jr., W.T.Leland, Phys. Rev. 106, 1257 (1957); Bull. Am. Phys. Soc. 2, No. 2, 104 J3 (1957).

$H^3(t,n)$ $E_t = 1.9$
Observed α peaks at 5 and 2 Mev may be due to He^5 formation and breakup sd 30°

56J30 N.Jarmie, R.C.Allen, W.T.Leland, Bull. Am. Phys. Soc. 1, No. 8, 388 L10 (1956).

Level $He^{(4)}(n,n)$ VdG
16.72 10 $\Gamma \leq 0.120$ He-filled ic

57B114 T.W.Bonner, P.W.Prosser, Jr., J.H. Slattery, Bull. Am. Phys. Soc. 2, No. 4, 180 E3 (1957).

Level? $H^3(d,n)$ $E_d = 1.0$ to 5.0
~22 p-recoil counter 6° to 155°
Present σ_t's combined with result of others for $E_d = 10.5$ suggest max in σ_t at $E_d \sim 8$
d,n(θ) forward peak increases in size with E_d

56G51 A.Galonsky, C.H.Johnson, Phys. Rev. 104, 421 (1956); 100, 1252A (1955).

$\sigma(\theta)$ $He^{(4)}(n,n)$ $E_n = 2.6$ to 4.15 CcW
n,n(θ) determined from energy distribution of He recoils measured in ic
$\sigma(\theta)$ accounted for by Dodder, Gammel phase shifts

57S101 H.R.Striebel, P.Huber, Helv. Phys. Acta 30, 67 (1957).

$Li^{(7)}(d,\alpha_1)He^5 \rightarrow n + \alpha_2$
$\alpha_1 n$ (θ) fits $1 + 0.72 \sin^2\theta$ $E_d = 0.16$
for $\theta = 100°$ to 160° pc, scin
Results compatible with Adair* $\sigma[He^4(n,n)]$ and with $\alpha_1,\alpha_2(\theta)$ = const; insensitive to location of first excited He^5 level

57P10 F.J.M.Farley, R.E.White, Nuclear Phys. 3, 561 (1957). *R.K.Adair, Phys. Rev. 86, 155 (1952).

$He^5_{2\ 3}$ $Li^{(7)}(d,\alpha)He^5 \rightarrow n + \alpha$ $E_d = 0.9$

Energies of α's given which are coincident with α's with $E_\alpha = 6.78$ or 8.20
Results consistent with Adair* $\sigma[He^4(n,n)]$

56R37 A.C.Riviere, Nuclear Phys. 2, 81 (1956). *R.K.Adair, Phys. Rev. 86, 155 (1952).

Polarization $H^2(d,n) \rightarrow He^{(4)}(n,n)$ $E_n = 3$
$P_1(45°)P_2(76°) = -0.069$ *26* He-filled pc

57W23 R.E.White, F.J.M.Farley, Nuclear Phys. 3, 476 (1957).

Polarization $H^2(d,n) \rightarrow He^{(4)}(n,n)$
Azimuthal asymmetry of n's scattered from He studied. Results consistent with Seagrave's* phase shifts. $E_n = 2.45$, 3.4; pc

57L28 I.I.Levintov, A.V.Miller, V.N.Shamsev, Zhur. Eksptl'. i Teoret. Fiz. 32, 274 (1957); Soviet Phys. JETP 5, 258 (1957); Nuclear Phys. 3, 221 (1957); Physica 22, 1181 (1956); Doklady Akad. Nauk SSSR 103, 803 (1955). *J.D.Seagrave, Phys. Rev. 92, 1222 (1953).

Li 3 Relative isotopic abundances ms

Li^6	7.42%	$Li^6/Li^7 = 12.47$ *2*
Li^7	92.58%	

55009 K.Ordzhonikidze, V.Shiuttse, Zhur. Eksptl' i Teoret. Fiz. 29, 479 (1955); JETP 2, 396 (1956).

$Li^5_{3\ 2}$ Levels $He^{(4)}(d,n)$ $E_d = 13.0$ Cyc
Time-of-flight n spectrum shows broad g.s. peak but none corresponding to ~2.5 level

56B143 G.F.Bogdanov, N.A.Vlasov, S.P. Kalinin, R.V.Rybakov, V.A.Sidorov, Zhur. Eksptl.' i Teoret. Fiz. 30, 981 (1956); Soviet Phys. JETP 3, 793 (1956).

$He^{(4)}(p,p)$ $E_p = 7.5, 9.48$
$p,p(\theta)$ found for $10° < \theta < 172°$ ppl
Phase shifts given

56P41 T.M.Putnam, J.E.Brolley, L.Rosen, Phys. Rev. 104, 1303 (1956); Bull. Am. Phys. Soc. 1, No. 1, 9AB2 (1956).

Level $He^3(d,p)$ $E_d = 0.1$ to 1.5 ic

$\sigma_o(90°)$	Level	E_o
0.0634 *32*	16.80	0.435 *30*

Graph of $\sigma(90°)$ given

56K47 A.P.Kliucharev, B.N.Esel'son, A.K. Val'ter, Doklady Akad. Nauk SSSR 109, 737 (1956); Soviet Phys. Doklady 1, 475 (1956).

$Li^6_{3\ 3}$ Levels $Li^{(6)}(d,d')Li^{6*} \rightarrow He^4 + d$

st	2.2	$E_d \leq 13.8$
w	4.5 ?	ppl

$Li^{(6)}(d,d')Li^{6*} \rightarrow He^4 + p + n$
7.6 *3*
$Li^{(7)}(d,t)\ Li^{6*} \rightarrow He^4 + d$
2.2
~4.5
~7.5

5×10^5 incident d's per cm^2 of plates
Reactions identified from energy, momentum balances and known Q values

56S121 I.L.Sokolov, M.M.Sulkovskaia, E.I. Karpushkina, E.A.Albitskaia, Zhur. Eksptl'. i Teoret. Fiz. 30, 1007 (1956); Soviet Phys. JETP 30, 740 (1956).

Levels $Li^6(p,p')$ $E_p, E_d = 7.0$ to 7.5
$Li^6(d,d')$ s 30° to 90°
$Be^9(p,\alpha)$
2.188 *6* $\Gamma = 0.024$
3.560* *6* $\Gamma < 0.005$
*Not found by $Li^6(d,d')$ (<0.9% of 2.188 level intensity for $E_d = 7.49$, $\theta = 60°$)
No other level below 5 Mev with $\Gamma < 0.1$ (<3% of 2.188 level intensity for $E_d = 7.45$, $\theta = 30°$ to 60°)

57B120 C.P.Browne, C.K.Bockelman, Phys. Rev. 105, 1301 (1957).

Level $Be^9(p,\alpha\gamma)$ $E_p = 2.56$
(3.56) $J = 0$ $p,\gamma(\theta)$ $\alpha\gamma(\theta)$

56S93 J.Stoltzfus, J.Friichtenicht, E.B. Nelson, Bull. Am. Phys. Soc. 1, No. 7, 325 J2 (1956).

Level $Li^6(\alpha,\alpha')$ $E_\alpha = 31.5$; 30° to 60°
(3.56) scins dE/dx, E
α's to this level <4% of α's to either 2.19 or 4.52 level

56W29 H.J.Watters, Phys. Rev. 103, 1763 (1956).

$Li^7_{3\ 4}$ Level $Li^{(7)}(p,p')$ $E_p = 12$
(4.61) $J = 5/2^{-*}$ a $p,p'(\theta)$
*$J = 7/2^-$ cannot be ruled out completely

57C53 H.E.Conzett, Phys. Rev. 105, 1324 (1957).

Level $Be^9(d,\alpha)$ $E_d = 0.5$ to 1.1
(4.61) s, ppl 23° to 90°
No α's to a 5.55 level (<5% of α's to g.s.)

56G56 R.W.Gelinas, S.S.Hanna, Phys. Rev. 104, 1681 (1956); 100, 1253A (1955).

$Li^{7}_{3\ 4}$ Level $Be^{9}(d,\alpha)$ $E_d = 4.04$ cyc

4.61 level not observed in study of $d, Li^{7}(\theta)$ indicating prompt dissociation

57T24 A.F.Tulinov, Zhur. Eksp't. i. Teoret. Fiz. 31, 698 (1955); Soviet Phys. JETP 4, 596 (1957).

Levels $Li^{7}(p,p')$ $E_p = 17.5$

st (4.61) $p,p'(\theta)$

w (7.46)

Relative intensity is that expected if both states belong to p^3 configuration

57M04 D.R.Maxson, E.P.Bennett, Bull. Am. Phys. Soc. 2, No. 4, 180 E5 (1957).

Level $Li^{6}(n)$ $E_n = 0.01$ to 0.45

σ	Level	E_o	
9.5 2	7.47	0.265	BF_3

Graph of σ given

56G62 G.V.Gorlov, B.M.Gokhberg, V.M.Morozov, G.A.Otroschenko, Doklady Akad. Nauk SSSR 110, 963 (1956); Soviet Phys. Doklady 1, 598 (1956).

Level $Li^{6}(n,\alpha)$ $E_n = 0.1$ to 0.6

7.68 $J = 5/2^-$ $\Gamma = 0.18$

$\theta_n^2 = 0.26$ $\theta_\alpha^2 = 0.0085$

From reanalysis of data of Blair, Holland*

56M91 J.B.Marion, G.Weber, F.S.Mozer, Phys. Rev. 104, 1402 (1956); *BNL-325 (1955).

Capture γ's $Li^{6}(n,\gamma)$ E_n = th

(Excitation = 7.245 Mev)

75 20† 6.78 5

100 † 7.26 3

$\sigma(n,\gamma) = 0.023$ 8

56B141 G.A.Bartholomew, P.J.Campion, Bull. Am. Phys. Soc. 1, No. 7, 324 E2 (1956); verbal report.

$Li^{8}_{3\ 5}$ Level $Li^{7}(n)$ $E_n = 0.01$ to 0.45

σ	Level	E_o	
7.0 2	2.28	0.275	BF_3

Graph of σ given

56G62 G.V.Gorlov, B.M.Gokhberg, V.M.Morozov, G.A.Otroschenko, Doklady Akad. Nauk SSSR 110, 963 (1956); Soviet Phys. Doklady 1, 598 (1956).

$Li^{8}_{3\ 5}$ $Li^{(7)}(th\ n,\gamma)$ polarized n

(Excitation = 2.04Mev)

Angular distribution of β's shows capture occurs mainly through $J = 2^-$ channel

57B144 M.T.Burgy, W.C.Davidson, T.B.Novey, G.J.Perlow, R.Ringo, Bull. Am. Phys. Soc. 2, No. 4, 206 M8 (1957); D.Kurath, Bull. Am. Phys. Soc. 2, No. 4, 206 M9 (1957); verbal report.

$Be^{7}_{4\ 3}$ τ 53.5^d 2 $Li^{(7)}(p,n)$ chem

53^d Decay followed for 3.5 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\gamma(Li^{7})$ 0.4773 4 sd pe

57M02 P.Marmier et al., Cal. Tech. work 1954; priv. comm. via F.Boehm.

$Be^{7}_{4\ 3}$ Level $Li^{6}(d,n_1\gamma)$ $E_d = 0.3$ to 1.5

(0.430) $J = 1/2^-$ $n_1\gamma(\theta)$; $d,n_1(\theta)$

56N13 G.C.Neilson, J.B.Warren, Phys. Rev. 103, 1758 (1956).

Level $He^{(4)}(He^3,He^3)$ $E_{He^3} = 3$ to 6

4.58 54° to 126°

$\Gamma = 0.16$ $\theta^2 = 0.3$

$J = 7/2^-$ from phase shifts

57P21 G.C.Phillips, P.Miller, Bull. Am. Phys. Soc. 2, No. 1, 28 J3 (1957); verbal report.

Levels $Li^{6}(p,\alpha)He^3$ $E_p = 0.6$ to 2.9

~6.4 $J = 3/2^{+*}$

7.80 $J = 5/2^-$ $\Gamma = 0.78$

$\theta_p^2 = 0.24$ $\theta_\alpha^2 = 0.048$

*Fits data for $p,\alpha(\theta)$ s α,He^3 20°, 60°

56M91 J.B.Marion, G.Weber, F.S.Mozer, Phys. Rev. 104, 1402 (1956).

$Be^{8}_{4\ 4}$ $Be^{9}(p,d)Be^{8}\rightarrow 2\alpha$ $E_p = 0.606$

$Q(Be^{8}\rightarrow 2\alpha) = 0.0937$ 9 s 83.4°

57C59 C.W.Cook, W.A.Fowler, C.C.Lauritsen, T.Lauritsen, Phys. Rev. 107, 508 (1957).

Be^8_4 Level $B^{(10)}(n,t_o)Be^8 \rightarrow 2\alpha$ $E_n = 14.1$
g.s. ppl
9 out of 360 three-particle stars assigned to above reaction
$\sigma \sim 3\%$ of $\sigma[B^{10}(n,t2\alpha)]$

57T13 E.W.Titterton, T.A.Brinkley, Nature 179, 368 (1957).

Level $He^{(4)}(\alpha,\alpha)$ $E_\alpha = 0.15$ to 0.20
g.s. $\Gamma \leq 3.5$ ev
$\tau \geq 1.4 \times 10^{-16}$s (half-life)
From unobservability of resonance

56H57 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 123 (1956).

Levels $Be^9(p,d)$ $E_p = 7.4$; 13.5°, 23°
$Be^9(d,t)$ $E_d = 14.8$; 15°
g.s.
2.9
No groups found to other levels in regions 0 to 6.5, 7.1 to 15.4 (<1% of g.s. group)

56C57 J.R.Cameron, Bull. Am. Phys. Soc. 1, No. 7, 324 E3 (1956); verbal report.

Levels $Li^{(7)}(d,n)$ ppl 0°, 90°

g.s.	
2.8	4.2
3.4	5.0

56F33 E.P.Ferreira, P.J.Waloschek, Proc. Internat. Conf. Peaceful Uses Atomic Energy (Geneva) 2, 124 (1956).

Levels $He^{(4)}(\alpha,\alpha)$ $E_\alpha = 3$ to 6

Level	J	Γ	θ^2
g.s.	0	4.5ev *30*	0.15
(2.9)	2	2.0Mev	0.7
(11.6)*	4*	6.7Mev*	0.95*

From phase shift analyses of their own data and those of Heydenburg and Temmer on $\sigma(E,\theta)$

56R41 J.L.Russell, Jr., G.C.Phillips, C.W. Reich, Phys. Rev. 104, 135 (1956); *R.Nilson, W.Jentschke, ibid.

Levels $Li^6(He^3,p)$ $E_{He^3} = 0.8$ to 5.0
g.s. scin
2.9 0° to 150°
12.6?
No p's to any other level below 14 Mev with $\Gamma \leq 1$ (<2% of p's to 2.9 level for $E_{He^3} = 2$)

56S101 J.P.Schiffer, T.W.Bonner, R.H.Davis, F.W.Prosser, Jr., Phys. Rev. 104, 1064 (1956); Bull. Am. Phys. Soc. 1, No. 7, 324 E1 (1956).

Be^8_4 Level $Be^9(d,t)$ $E_d = 0.5$ to 1.1
(2.9) s,ppl 23° to 90°
No t's to levels between 3.4 and 4.8 (<2% of t's to 2.9 level)

56G56 R.W.Gelinas, S.S.Hanna, Phys. Rev. 104, 1681 (1956); 100, 1253A (1955).

$He^{(4)}(\alpha,\alpha)$ $E_\alpha = 12.3$ to 22.9
$\alpha,\alpha(\theta,E)$ studied pc, ppl $\theta = 11°$ to 75°

56N20 R.Nilson, R.O.Kerman, G.R.Briggs, W.Jentschke, Phys. Rev. 104, 1673 (1956).

Levels $He^{(4)}(\alpha,\alpha)$ $E_\alpha = 38.5$ cyc

Level	J	ppl 30° to 110° c.m.
~11.0	4^+	[from phase shift
~19.0	$0^+, 2^+$	[analysis of $\alpha,\alpha(\theta)$

Graph of $\sigma(\theta$ c.m.) given

57B148 W.E.Burcham, W.M.Gibson, D.J.Prowse, J.Rotblat, Nuclear Phys. 3, 217 (1957).

Levels $Li^{(7)}(p,\alpha)$ $E_p = 0.12$ to 0.57
10^6 tracks, ppl

E_o	Level
0.390 5	17.583
0.440 5	17.627
0.480?5	17.662?

Graphs as $f(E_p)$ given for σ, $\sigma(90°)$, and coefficients of $\cos^2$ and $\cos^4$ for $p,\alpha(\theta)$

57T20 U.Timm, Naturwiss. 43, 279 (1957).

Levels $Li^7(p,n)$ $E_p = 0$ to 12

21.5	
22.5	24.9 2
23.8	25.6 2

57K04 S.P.Kalinin, A.A.Ogoblin, Y.M.Petrov, Atom. Energiya 2, 121; J. Nuclear Energy 5 (1957).

Level $Li^6(d,n_1\gamma)$ $E_d = 0.3$ to 1.5
22.6 n time-of-flight

56N13 G.C.Neilson, J.B.Warren, Phys. Rev. 103, 1758 (1956).

$Li^6(d,n_1\gamma)$ $E_d = 0.2$ to 1.8
$Li^6(d,p_1\gamma)$ scin γ
(Excitation = 22.4 to 23.6 Mev)
$\sigma(n_1)/\sigma(p_1) \sim 1$ indicates validity of charge symmetry within an accuracy of 15%
A possible broad resonance was observed for $E_d = 0.45$

57W24 D.H.Wilkinson, Phil. Mag. 2, 83 (1957).

Be^9_4 $_5$

Levels $Be^9(p,p')$ $E_p \sim 7$; s 40°, 130°

1.664?	5	edge not peak seen
2.434	5	
3.03	3	$\Gamma > 0.28$

$B^{(11)}(d,\alpha)$ $E_d = 5.0$ to 7.3

g.s.		$Q = +8.015$ 10 s 60°, 90°
1.669?	10	edge not peak seen
2.424	5	
3.05	3	$\Gamma = 0.25, 0.43$ in two different measurements

56B118 C.K.Bockelman, A.Lévêque, W.W. Buechner, Phys. Rev. 104, 456 (1956); Bull. Am. Phys. Soc. 1, No. 6, 280 B1 (1956).

Level $Be^9(\gamma,n)$ $E_\gamma = 1.6$ to 2.1

$\sigma_o \sim 0.1$ 1.70 5 $\Gamma < 0.05$

(γ,n) threshold 1.664 4

56C56 D.R.Connors, W.C.Miller, Bull. Am. Phys. Soc. 1, No. 7, 340 P12 (1956).

Levels $Li^{(7)}(d,p)$ $E_d = 1.0$ to 4.0 cyc

18.3	β activity of 0.8^s Li^8
18.7	
19.6	

57B51 L.S.Bezrukov, D.A.Panev, D.V.Timoshuk, J. Nuclear Energy 4, 521 (1957).

$\sigma(\theta)$ $Li^{(7)}(d,\alpha_o)$ $E_d = 0.900$

$d,\alpha_o(\theta)$ is isotropic within 2%; pc 0° to 148°

57R39 A.C.Riviere, P.B.Treacy, Australian J. Phys. 10, 209 (1957).

$Be^9(\gamma,p)$ $E_\gamma \leq 25$

Very few p's with $E_p > 4$ implying that transitions to low-lying Li^8 levels are rare

56C59 L.Cohen, A.K.Mann, B.J.Patton, K. Reibel, W.E.Stephens, E.J.Winhold, Phys. Rev. 104, 108 (1956).

Be^{10}_4 $_6$

Level $Be^9(d,p\gamma)$ $E_d = 2.5$ to 4

(3.37) $l_n = 1$ scin $d,p(\theta)$

$p\gamma(\theta)$ consistent with 10% mixture of channel spin 1 which is predicted for pure LS^3P_2 configuration

57C54 S.A.Cox, R.M.Williamson, Phys. Rev. 105, 1799 (1957); 99, 631A (1955); Bull. Am. Phys. Soc. 1, No. 4, 196 N4 (1956).

Level $Be^9(n,n)$ $E_n = 0.53$ to 0.9

(7.37) $J = 2^+, 3^+$ $\sigma(E,\theta)$

$\Gamma \sim 0.024$

56L07 R.O.Lane, J.E.Monahan, Bull. Am. Phys. Soc. 1, No. 4, 187 K1 (1956); priv. comm.

Be^{10}_4 $_6$

$Be^9(n,\alpha)$ $E_n = 0.7$ to 4.4

No resonances for production of 0.83^s He^6 observed

σ shows broad max (104mb 7) at $E_n = 3.0$

57S95 P.H.Stelson, E.C.Campbell, Phys. Rev. 106, 1252 (1957).

B^9_5 $_4$

Levels $Li^6(He^3,p)$ $E_{He^3} = 0.8$ to 5.0

17.6	$\Gamma = 0.25$	scin
18.6	$\Gamma = 1.5$	0° to 150°

σ's given

p's to g.s. stronger than p's to Be^8 2.9 level

$He^3, p_o(\theta) \sim 90°$-symmetric for $E_{He^3} \leq 2$, not for $E_{He^3} = 3$ to 5

$He^3, p_1(\theta)$ not 90°-symmetric for $E_{He^3} = 2$ to 5

56S101 J.P.Schiffer, T.W.Bonner, R.H.Davis, F.W.Prosser, Jr., Phys. Rev. 104, 1064 (1956); Bull. Am. Phys. Soc. 1, No. 7, 324 E1 (1956).

B^{10}_5 $_5$

Levels $C^{(12)}(d,\alpha)$ $E_d = 8.90$

g.s.	$Q = -1.39$ 2	ppl 10°
0.72	2	
2.14	2	

Absence of α group to 1.74 level consistent with T = 1 assignment

Graphs of $d,\alpha(\theta)$ given

57E12 F.A.El Bedewi, I.Hussein, Proc. Phys. Soc. 70A, 233 (1957).

Level $Be^9(d,n\gamma)$ $E_d = 0.85$

(0.72) $\tau = 0.59^{m\mu s}$ 14 recoil

56S108 J.C.Severiens, S.S.Hanna, Phys. Rev. 104, 1612 (1956); 100, 1254A (1955).

Level $B^{10}(p,p'\gamma)$ $E_p = 3$, pulsed

(0.72) $\tau = 0.73^{m\mu s}$ 7 $p\gamma$ delay

57B102 S.D.Bloom, C.M.Turner, D.H.Wilkinson, Phys. Rev. 105, 232 (1957).

Levels $Be^9(p,p)$ $E_p = 0.2$ to 3.0 sd; $p,p(\theta)$

E_o	Level	J	θ_p^2	Γ(kev)	Γ_p/Γ
0.330	6.882	1^-	~ 0.5*		0.18
0.980	7.467	2^+	0.07		~ 0.9
0.998	7.486	2^-	0.02	150	0.65
1.084	7.561	0^+		3	
1.330	7.792	2^-	0.05	400	0.65

$p,p(\theta)$ analyzed

*$p,d(\theta)$; $p,\alpha(\theta)$ also suggest $\theta_d^2 \sim 0.4$; $\theta_\alpha^2 \sim 0.05$

56M90 F.S.Mozer, Phys. Rev. 104, 1386 (1956).

$B^{10}_{5\ 5}$

Levels $Be^9(p,d_o)$ E_p = 0.8 to 3.0
s 15° to 135°

E_o	Level	
0.93	7.42	Γ = 130 *30* kev
1.25	7.70	
1.64	8.06	
2.3	8.56	

Levels at 7.56, 8.89 not seen. σ (above background) <0.013 for 8.89 level

$Be^9(p,\alpha_o)$ E_p = 0.8 to 3.0

2.56 8.89 $0.08 < \Gamma_\alpha < 4.0$ kev 90°

Anomalies also seen at $E(B^{10})$ = 7.42, 7.8

56W37 G.Weber, L.W.Davis, J.B.Marion, Phys. Rev. 104, 1307 (1956).

$B^{10}_{5\ 5}$

Levels $Be^9(p,p)$ E_p = 0.8 to 2.6
s 4 angles

E_o	Level	J	l_p	Γ(kev)	Γ_p/Γ
(0.998)	(7.483)	2^-	0	90	0.7
(1.087)	(7.563)	0^+	1	small	
1.1	7.6?		1	200	$\ll 1$
1.35	7.80 *5*	2^-	0	500	0.8
(2.56)	(8.89)	$\geq 2^+$	≥ 1	large	

p, p(θ) analyzed

56D33 G.Dearnaley, Phil. Mag. 1, 821 (1956).

Capture γ's $Be^9(p,\gamma)$ scin

6.88 level		E_p = 0.330	
4.5†	**0.420** *4*	6.2†	**2.176** *20*
100†	**0.731** *8*	12†	**4.71**
76†	**1.018** *7*	60†	**5.12**
4.3†	**1.426** *21*	24†	**6.14**
15†	**1.74**		

p,(1.74, 4.71, 5.12, 6.14 γ)(θ) ~isotropic
Data show J(6.88 level) = 1^-, 2^-, or 1^+
Conclude $J = 1^-, T = 0$ with large T = 1 admixture*

56C69 A.B.Clegg, Phil. Mag. 1, 1116 (1956).
*D.H.Wilkinson, A.B.Clegg, Phil. Mag. 1, 291 (1956).

Reaction γ's $B^{10}(p,p'\gamma)$ E_p = 0.7 to 3.0

0.71 *2*	$\sigma(E_p)$ given
1.00 *4*	found for $E_p > 2.4$
2.12 *6*	found for $E_p > 2.4$

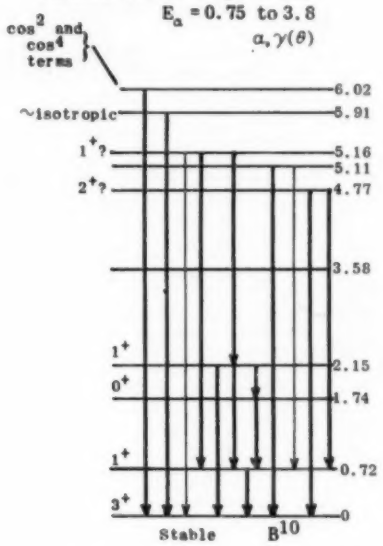
57H79 S.E.Hunt, R.A.Pope, W.W.Evans, Phys. Rev. 106, 1012 (1957).

Reaction γ's $Be^9(d,n\gamma)$
$(2.86\ \gamma)(0.72\ \gamma)(\theta) = 1 - (0.05 \pm 0.02)\cos^2\theta$
J= 2, 1, 3 or 1, 1, 3 for 3.58, 0.72, 0 levels

56S94 S.M.Shaforth, S.S.Hanna, Phys. Rev. 104, 399 (1956).

$B^{10}_{5\ 5}$

Capture γ's $Li^6(\alpha,\gamma)$ scin
E_α = 0.75 to 3.8
$\alpha,\gamma(\theta)$



57H05 S.S.Hanna, L.Meyer-Schutzmeister, Bull. Am. Phys. Soc. 2, No. 4, 180 E4 (1957); verbal report.

$B^{11}_{5\ 6}$

Levels $B^{10}(d,p\gamma)$ E_d = 2.5 to 4
scin d, p(θ)

Level	l_n	
g.s.	1	
(2.14)		No stripping peak
(4.46)	1	$J \neq 9/2$ $p\gamma(\theta)$
(5.03)		No stripping peak
(6.76)	1	$J \neq 3/2$ $p\gamma(\theta)$

p(6.81 level)/p(6.76 level) <0.15 s 10°, 20°

57C54 S.A.Cox, R.M.Williamson, Phys. Rev. 105, 1799 (1957); 99, 631A (1955); Bull. Am. Phys. Soc. 1, No. 4, 196 N4 (1956).

Levels $B^{10}(d,p)$ E_d = 1 to 3; d, p(θ)

g.s.	l_n = 1 peak appears at $E_d \sim 2$
(2.14)	No stripping effect seen*
(4.46)	90° symmetry at E_d = 2.0
(5.03)	Stripping peak at E_d = 2.0

*If $J = 1/2^-$, rearrangement of several nucleons would be necessary

56M69 J.B.Marion, G.Weber, Phys. Rev. 103, 1408 (1956).

Level $B^{(11)}(p,p'\gamma)$ E_p = 3.0

2.11 *5* $\tau < 0.04^{\mu\mu s}$ M1 Doppler shift

$\therefore J = 1/2^-$

$J = 3/2^-$ ruled out by τ and γ isotropy
l_n = 1 found by others from d, p(θ) explained as due to spin-flip process

57W26 D.H.Wilkinson, Phys. Rev. 105, 666 (1957)

Level $B^{11}(p,p'\gamma)$ E_p = 2.0 to 5.3

(2.14) $J = 1/2$ (3/2?) p, $\gamma(\theta)$

55B122 J.K.Bair, J.D.Kington, H.B.Willard, Phys. Rev. 100, 21 (1956).

$B^{11}_{5\ 6}$

Level $B^{(11)}(\gamma,\gamma)$ C^{12} 4.43γ

(4.46) $\tau = 0.76^{m\mu s}$ *14*

56S116 C.P.Swann, F.R.Metzger, V.K.Rasmussen, Bull. Am. Phys. Soc. 2, No. 1, 29 J10 (1957); verbal report.

Levels $Li^{(7)}(\alpha,\gamma)$ E_α = 0.40, 0.82, 0.96

Level	J	$\alpha,\gamma(\theta)$
(4.46)	$3/2^-$, $5/2^-$	
(9.19)	$3/2^-$, $5/2^+$	
(9.28)	$3/2^-$, $5/2^-$	

57M48 L.Meyer-Schützmeister, S.S.Hanna, Bull. Am. Phys. Soc. 2, No. 1, 28 J5 (1957); verbal report.

Levels $B^{10}(d,p)$ E_d = 0.80 CcW

6.76, 6.81, 7.30 sd, 8° to 135°c.m.

A_1 given for d,p(θ)

57S60 B.Sjogren, Arkiv Fysik 11, 383 (1957).

Levels $B^{(10)}(d,p)$ E_d = 4.15

6.789 *30* s ~110°

7.249?*30*

8.389 *30*

8.957 *30*

Isotopic assignment due to other workers

55K35 L.M.Khromchenko, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 277 (1955), Columbia Tech. Transl. p.252.

Capture γ's $B^{10}(n,\gamma)$ E_n = th

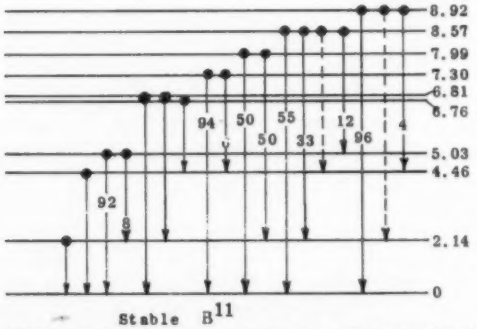
(Excitation = 11.459 Mev)

100†	4.47 *2*	20†	6.98 *3*
	4.73 *3*	7†	8.91 *3*
	6.76 *4*	1†	11.43 *4*

$\sigma(n,\gamma)$ = 0.5 *2*

56B141 G.A.Bartholomew, P.J.Campion, Bull. Am. Phys. Soc. 1, No. 7, 324 E2 (1956); verbal report.

Reaction γ's $Be^9(He^3,p\gamma)$ E_{He^3} = 2.1 scin pγ



57F05 A.J.Ferguson, H.E.Gove, A.E.Litherland, E.Almqvist, D.A.Bromley, Bull. Am. Phys. Soc. 2, No. 1, 51 RA2 (1957); verbal report.

$B^{11}_{5\ 6}$

$Be^9(d,p)$ d,p(θ); ppl

(Excitation = 15.90 to 15.98 Mev)

$\sigma(10^{-6}b)$	A_1/A_o	A_2/A_o	E_d
4.9 *20*	+0.99 *4*	0.00 *4*	0.100*
16 *4*	+0.89 *4*	0.00 *4*	0.170
37 *10*	+0.94 *4*	0.00 *4*	0.200

*Possible fine structure in d,p(θ) at this E_d

$Be^9(d,t)$ d,t(θ); ppl

$\sigma(10^{-6}b)$	A_1/A_o	A_2/A_o	E_d
5.4 *20*	+0.70 *4*	− 0.19 *4*	0.100
15 *4*	+0.58 *4*	− 0.33 *4*	0.170
34 *10*	+0.63 *4*	− 0.31 *4*	0.200

57S80 R.K.Smither, Phys. Rev. 107, 196 (1957).

$B^{12}_{5\ 7}$ ^{18ms}

τ **18.5^{ms}** *10* $B^{(11)}(d,p)$

56N15 E.Norbeck,Jr., Bull. Am. Phys. Soc. 1, No. 7, 329 J3 (1956).

τ $18^{ms}{}^{+1.5}_{-1.3}$ C^{13}(20- to 38-Mevγ,p)

57C57 B.C.Cook, Phys. Rev. 106, 300 (1957); 104, 554 (1956).

β^- 1.3% *4* (5.72)

From study of α's from $B^{11}(d,p)B^{12}\xrightarrow{\beta}C^{12*}\rightarrow Be^8+\alpha$

57C59 C.W.Cook, W.A.Fowler, C.C.Lauritsen, T.Lauritsen, Phys. Rev. 107, 508 (1957); Bull. Am. Phys. Soc. 1, No. 4, 191 M2 (1956).

$B^{12}_{5\ 7}$

Level $C^{14}(d,\alpha)$ EA 134°

g.s. Q=+**0.3620** *15*

56D41 R.A.Douglas, J.W.Broer, R.Chiba, D.F. Herring, E.A.Silverstein, Phys. Rev. 104, 1059 (1956).

Levels $Li^{(6)}(Li^7,p)$ E_{Li^7} = 2.0 VdG

10† g.s. a+scin 90°

11† (0.93)

8† (1.67)

57N14 E.Norbeck, Jr., Phys. Rev. 105, 204 (1957).

Levels $B^{(11)}(d,p)$ E_d = 4.15

g.s. Q=+**1.10** s ~110°

0.940 *30*

1.664 *30*

2.562* *30*

No 1.82 level

Isotopic assignment due to other workers

*Assignment uncertain

55K35 L.M.Khromchenko, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 277 (1955), Columbia Tech. Transl. p.252; Doklady Akad. Nauk SSSR 94, 1037 (1954).

$B^{13}_{5\ 8}$ τ 35^{ms} $Li^7(Li^7,p)$
35^{ms}
Found after subtraction of $18^{ms}B^{12}$ activity
No neutrons observed

56N15 E.Norbeck,Jr., Bull. Am. Phys. Soc. 1 No. 7, 329 J3 (1956).

$B^{13}_{5\ 8}$ Level $Li^{(7)}(Li^7,p)$ E_{Li^7} = 1.61 VdG
g.s. Q=+5.97 5 a+scin 90°
$\sigma(90°)$ rises from 1.2 to 19 mb/sr as E_{Li^7} increases from 1.4 to 1.95

57N14 E.Norbeck, Jr., Phys. Rev. 105, 204 (1957); Phys. Rev. 102, 1182 (1956).

C Relative isotopic abundances ms
6 No C^{10}, C^{11}, C^{15} (<0.005%)
No C^{14} (<0.01%)

57K09 L.Kerwin, D.E.McElcheran, M.Cottin, Can. J. Phys. 35, 783 (1957).

$C^{11}_{6\ 5}$

Levels Rel σ(0°c.m.)	B^{10}(d,n) Level	l_p	E_d = 7.55 ppl 0° to 165°
1.5	g.s.	1	
0.3	1.86	1	
1.7	4.28	1	
1.0	4.77	1	
3.4	6.40		
1.0	6.78		
0.3	7.41		
0.9	8.09		Rel σ's for 0°,20°,45°, 75° given
5.0	8.40		
5.2	8.62		
1.4	8.98		
1.7	9.28		
1.4	9.69		
1.4	10.09		
2.1	10.69		
1.5	10.89		
	11.26?		
	11.52		

56C73 M.Cerineo, Nuclear Phys. 2, 113 (1956); Physica 22, 1154A (1956).

Levels B^{10}(d,n) E_d = 1.08; ppl
g.s.
2.02 4 } d,n(θ) ~isotropic
4.24 3 l_n = 0
4.73 3 l_n = 2

56G54 A.Graue, Phil. Mag. 1, 1027 (1956).

460722 O - 58 - 2

$C^{11}_{6\ 5}$

Levels $\sigma(\theta)$ in mb/sr	B^{10}(d,n) Level	E_d = 9; d,n(θ) l_p	(2J+1)θ^2
22°c.m. 2.2	g.s.	1	0.09
22°c.m. 1.0	(1.90)	1	0.035
12°c.m. 2.6	(6.46 and 6.87)	1	
12°c.m.13.0	(8.44 and 8.68)	1	

56M83 E.E.Maslin, J.M.Calvert, A.A.Jaffe, Proc. Phys. Soc. 69A, 754 (1956).

Level $B^{10}(He^3,d\gamma)$ E_{He^3} = 2.14
2.0 1 scin dγ

57G28 H.E.Gove, A.E.Litherland, E.Almqvist, D.A.Bromley, A.J.Ferguson, Bull. Am. Phys. Soc. 2, No. 1, 51 RA3 (1957); verbal report.

Levels B^{10}(d,n) E_d = 7.0 VdG
8.5 l_p = 0 d,n(θ) ppl
9.0 ppl 0°
10.0
10.5
10.85

57G50 A.Graue, B.Trumpy, Phil. Mag. 2, 138 (1957).

Levels B^{10}(p,γ) E_p = 0.7 to 3.0
E_p Level scin
1.146 5 9.739 9.7γ (100†) 4.2γ (5†)
Γ = 0.414 20 σ_0 = 5.5μb 2
No resonances seen at E_p = 0.78, 0.95, 1.33, 2.4

$B^{10}(p,\alpha+0.43\gamma)$
1.540 5 10.097 broad σ_0 = 80mb 40

57H79 S.E.Hunt, R.A.Pope, W.W.Evans, Phys. Rev. 106, 1012 (1957).

Levels B^{10}(p,α) E_p = 0 to 12
12.3
13.8 2
15.7 2

57K04 S.P.Kalinin, A.A.Ogoblin, Y.M.Petrov, Atom. Energiya 2, 121; J. Nuclear Energy 5 (1957).

$C^{12}_{6\ 6}$

Levels $B^{10}(\alpha,d)$ EA 134°
g.s. Q = +1.341 1

$N^{(14)}(d,\alpha)$
9.637 Q = +3.933 14 EA 134°
Γ = 0.030 8 (c.m.) implies $l_\alpha \leq 3$

56D41 R.A.Douglas, J.W.Broer, R.Chiba, D.F. Herring, E.A.Silverstein, Phys. Rev. 104, 1059 (1956).

$C^{12}_{6\ 6}$

Levels $B^{11}(d,n)$ $E_d = 9$; $d,n(\theta)$

$\sigma(\theta)$ in mb/sr	Level	l_p	$(2J+1)\theta^2$
22°c.m. 3.3	g.s.	1	0.115
22°c.m. 4.7	(4.43)	1	0.14
0°c.m. < 0.5	(7.65)		
38°c.m. 2.4	(9.61)	2	0.14

56M83 E.E.Maslin, J.M.Calvert, A.A.Jaffe, Proc. Phys. Soc. 69A, 754 (1956).

Level $C^{(12)}(\gamma,\gamma)$ C^{12} 4.43γ

(4.43) $\tau = 0.049^{\mu\mu s}$ *14*

56S116 C.P.Swann, F.R.Metzger, V.K.Rasmussen, Bull. Am. Phys. Soc. 2, No. 1, 29 J10 (1957).

Level $C^{(12)}(e,e')$

(4.43) $\tau \sim 0.038^{\mu\mu s}$

From analysis of $\sigma(e,e')$ at $E_e = 187$*

56H83 R.H.Helm, Phys. Rev. 104, 1466 (1956); *J.H.Fregeau, R.Hofstadter, Phys. Rev. 99, 1503 (1955).

Levels $C^{(12)}(p,p')$ $E_p = 185$

4.3 *2*		s, 5° to 50°
7.5 *2*	15.0 *2*	
9.5 *2*	19.0 *3*	
12.6 *2*	21.9 *3*	

Graph of $\sigma(\theta)$ for each level given

57T28 H.Tyrén, T.A.J.Maris, Nuclear Phys. 3, 52 (1957); Physica 22, 1171A (1956).

Levels $B^{11}(d,p)0.03\,^{s}B^{12} \xrightarrow{\beta} C^{12} \xrightarrow{\alpha} Be^{8}$

7.652 *4* $E_\alpha = 0.185$ *3* s

~9 $\Gamma \sim 1$ $E_\alpha \sim 1.6$

$\alpha/(B^{12}\ \beta) = 0.014$ $(\sim 1.6\alpha)/(0.185\alpha) \sim 0.1$

56C60 C.W.Cook, Bull. Am. Phys. Soc. 1, No. 8, 390 M9 (1956); verbal report.

Level $C^{(12)}(d,d')$ $E_d = 19$

(7.6) $\sigma = 0.047$ *5* ppl

Graph of $d,d'(\theta)$ given

56C65 J.Catalá, E.Villar, A.Bonet, Anales real soc. espan. fis. y quim. 52A, 93 (1956).

Level $Be^{9}(\alpha,n\gamma)$ $E_\alpha = 5.3$

(7.6) J = 0 scin $\gamma\gamma(\theta)$

(3.22γ)(4.43γ)(θ) $\eta(\pi) = +0.95$ *50*

57S106 K.G.Steffen, H.Neuert, Z. Physik 147, 125 (1957).

$C^{12}_{6\ 6}$

Level $N^{(14)}(d,\alpha)$ $E_d = 19.4$ cyc

7.70 *2* ppl 50° to 165°

$\int \sigma d\theta \leq 0.34$ mb

Level $C^{(12)}(p,p')$ $E_p = 9.5$ cyc

7.6 *1* ppl 50° to 165°

$\sigma(95°) = 0.8$ *2* mb/sr

57H65 A.Hossain, D.J.Prowse, Nuovo Cim. 5, 973 (1957).

Level $B^{11}(d,p)B^{12} \overset{\beta}{\leq} C^{12*} \rightarrow Be^{8} + \alpha$

7.653 *8* $Q(\rightarrow Be^{8} + \alpha) = +0.278$ *4*

57C59 C.W.Cook, W.A.Fowler, C.C.Lauritsen, T.Lauritsen, Phys. Rev. 107, 508 (1957).

Level $C^{(12)}(e,e')$ $E_e = 187$

(9.61) $J = 2^+$ (0^+) $e,e'(\theta)$

$\sigma(\theta)$ shows transition is probably E2 (or E0)

56F27 J.H.Fregeau, Phys. Rev. 104, 225 (1956).

Levels $B^{10}(He^3,p\gamma)$ $E_{He^3} = 2.14$

	(12.76)	$\Gamma_{\gamma_0}/\Gamma \sim 0.02$	scin pγ
100†	15.10 *5*	$\Gamma_{\gamma_0}/\Gamma = 0.77$ *20*	
		$\Gamma_{\gamma_1}/\Gamma_\gamma = 0.03$	

No 5.5 level (p's to this level < 2†)

57G28 H.E.Gove, A.E.Litherland, E.Almqvist, D.A.Bromley, A.J.Ferguson, Bull. Am. Phys. Soc. 2, No. 1, 51 RA3 (1957); verbal report.

Level $C^{(12)}(\gamma,\gamma')$

(15.1) $\Gamma = 79$ *16* ev scin

$\Gamma_{\gamma_0} = 54.5$ *93* ev

$\Gamma_{\gamma_1}/\Gamma \leq 0.1$

57H13 E.Hayward, E.G.Fuller, Phys. Rev. 106, 991 (1957); Bull. Am. Phys. Soc. 1, No. 1, 21 DA8 (1956); Physica 22, 1138A (1956).

Levels $B^{(11)}(p,\gamma)$ $E_p = 0.168$

(16.10)	$(J = 2^+)$	0° to 120°
(17.22)	$J = 1^-$	scin

p,16.1γ(θ) = 1 + (0.19 *6*)cos θ + (0.21 *7*)cos²θ

In agreement with calculation if $J = 1^-$ is assigned to 17.22 level

56C49 D.S.Craig, W.G.Cross, R.G.Jarvis, Phys. Rev. 103, 1414 (1956).

$C^{12}_{6\ 6}$

Levels* $C^{(12)}(\gamma,p)$ $E_\gamma \leq 25$ ppl 90°

2†	17.3	
6†	20.8	
9†	21.5	
12†	22.6	

*If all protons observed go to B^{11} g.s.
†Approximate $\int \sigma dE$ in Mev-mb

56C59 L.Cohen, A.K.Mann, B.J.Patton, K.Reibel, W.E.Stephens, E.J.Winhold, Phys. Rev. 104, 108 (1956).

Levels $B^{11}(p,n)$ E_p = 0 to 12

22.0
24.0
25.2

57K04 S.P.Kalinin, A.A.Ogoblin, Y.M.Petrov, Atom. Energiya 2, 121; J. Nuclear Energy 5 (1957).

Reaction γ's $C^{(12)}(p,p'\gamma)$ E_p = 31

9.5	14†	10.7	sπ pr 80°
~10	†	12.8	2
100	†	15.1	

15.1γ yield given for E_p = 80 to 340
15.1γ also found from (n,n'),(d,n),(α,n) but not from (α,α'),(d,d')

57W04 C.N.Waddell, H.E.Adelson, B.J.Moyer, H.C.Shaw, Bull. Am. Phys. Soc. 2, No. 4, 181 E10 (1957); priv. comm.

$C^{(12)}(\gamma,\alpha_1)$ E_γ = 17.6 Li(p,n)
$\gamma,\alpha_1(\theta)$ not 90°-symmetric. Shows forward peak. Consistent with E1 + E2 absorption.

57M98 J.Muto, E.Takekoshi, T.Nakamura, A. Imamura, Y.Tsumeoka, J. Phys. Soc. Japan 12, 109 (1957).

σ $C^{(12)}(\gamma,p)$ E_γ = 17.63
(Excitation = 17.6 Mev)
$\sigma(\gamma,p)/\sigma(\gamma,3\alpha)$ = 7.00 *73*
If $\sigma(\gamma,3\alpha)$ = 0.170 *24* then $\sigma(\gamma,p)$ = 1.19 *21*
$\sigma(\gamma,p)$ calc. from detailed balance = 1.09 *16*

56M97 A.K.Mann, E.W.Titterton, Proc. Phys. Soc. 69A, 917 (1956).

$B^{10}(d,p)$ E_d = 0.9 to 3.0
$B^{10}(d,\alpha)$ scin 45°, 90°, 150°
Excitation = 25.9 to 27.7
Maxima observed in reaction yields

	d,p_0	d,p_1	d,p_2	d,p_3	d,α_0
E_d	1.0	1.0			1.0
	1.5	1.6	1.4		1.4?
	2.0			~2	2.0
	2.2		2.2		
	2.4				
	2.7	2.7	2.8		

56M69 J.B.Marion, G.Weber, Phys. Rev. 103, 1408 (1956).

$C^{12}_{6\ 6}$

$Be^9(He^3,p_o)$ E_{He3} = 2.0 to 3.8
$Be^9(He^3,p_1)$
Excitation = 27.8 to 29.1
No resonances observed
Angular distributions not symmetric about 90°

56W32 E.A.Wolicki, H.D.Holmgren, R.L. Johnston, E.H.Geer, Bull. Am. Phys. Soc. 1, No. 7, 325 E5 (1956).

Polarization $H^2(d,n) \rightarrow C^{(12)}(n,n)$
$P_1(53°\text{c.m.})P_2(\theta_2) \propto \sin 2\theta_2$ agreeing with $C^{12}(n,n)$ phase shifts
E_d = 0.600 to 0.700; scin

56M70 B.M.McCormac, M.P.Steuer, C.D.Bond, F.L.Hereford, Phys. Rev. 104, 718 (1956).

$C^{13}_{6\ 7}$

Level $B^{(11)}(d,n)$ E_d = 0.5 to 1.15 VdG
g.s. scin, 0° to 150°c.m.
d,n(θ) consistent with exchange-stripping theory of Owen and Madansky*

57A48 O.Ames, G.E.Owen, C.D.Swartz, Phys. Rev. 106, 775 (1957); *G.E.Owen, L.Madansky, Phys. Rev. 105, 1766 (1957).

Level $B^{10}(\alpha,p)$ E_α = 5.3
g.s. Q = + 4.10 *3* 15 angles
α,p(θ) has max at 120°,180° ppl
Max at 120° accounted for by Madansky-Owen "target" stripping*

56P34 A.Papkow, Z. Naturf. 11a, 776 (1956). *Phys. Rev. 99, 1608 (1955).

Levels $N^{15}(d,\alpha)$ E_d = 14.8

mb/sr(12.6°)	Level	
0.85 *9*	g.s.	
0.18 *3*	(3.09)	
2.4 *3*	(3.68)	
<0.3	(3.86)	
1.3* 2	(6.87)	
1.1 2	(7.53, 7.64)	
0.56 *11*	8.80 4	
0.15 4	9.5	
0.26 *6*	9.9	

s + scin 12.6°
*18°

57W01 E.K.Warburton, J.N.McGruer, Phys. Rev. 105, 639 (1957).

Levels $B^{11}(He^3,p)$ E_{He3} = 1.25

100†	g.s.	s 45°, 90°, 135°
	(3.097)*	8.85 *6*
	(3.684)*	9.54 *8*
	(3.844)*	9.92 *6*
~5†	5.49 *8*	10.90 *15*
~5†	6.09 *8*	11.10 *15*
	(6.864)*	12.08 *10*
	7.58 *6*	12.81 *10*

*Used for calibration

57G01 A.Galonsky, C.D.Moak, R.L.Troughber, C.M.Jones, Bull. Am. Phys. Soc. 2, No. 1, 51 RA1 (1957).

$C^{13}_{6\ 7}$

Levels	$C^{(12)}$(d,p)	E_d = 19.2
2.99 *19*		ppl 13 angles
3.41* *7*		
3.65 *10*		
3.89 *10*		

*d,p(θ) has strong forward peak, minimum at 30°, and weak maximum at 45°

56C74 J.Catalá, E.Villar, A.Bonet, Anales real soc. espan. fis. y quim. 52A, 251 (1956).

Levels	$C^{(12)}$(d,p)	E_d = 4.40
3.107 *15*		s ~110°
3.699 *15*		
3.869 *15*		

55K35 L.M.Khromchenko, Izvest. Akad. Nauk. Ser. Fiz. SSSR 19, 277 (1955), Columbia Tech. Transl. p. 252; Doklady Akad. Nauk SSSR 93, 451 (1953).

Levels	$C^{(12)}$(d,p)	EA 134°
3.683	Q = −0.960 2	
3.853	Q = −1.130 2	

56D41 R.A.Douglas, J.W.Broer, R.Chiba, D.F. Herring, E.A.Silverstein, Phys. Rev. 104, 1059 (1956).

Levels	B^{10}(α,p) E_α=3, 3.5, 4.2 from Po	
3.88	5.05	cc
4.21	5.30	
4.49	5.43	
4.66	5.62	
4.80	5.78	
4.90	5.97	

Assumed g.s. Q = +4.07

57R52 R.R.Roy, A.Lagasse, M.L.Goes, R.Achari, A. deHenau, Compt. rend. 244, 2907 (1957).

Level	$C^{(12)}$(n)		
σ_o = 5.7 2	6.865 *8*	Γ = 0.008	J = 5/2 σ_t

56C54 H.O.Cohn, J.K.Bair, H.B.Willard, Bull. Am. Phys. Soc. 1, No. 7, 346 X4 (1956).

Levels	Be^9(α,nγ)		E_α = 0.4 to 1.3
broad	(11.02)	($1/2^+$)	d-recoil-ic n, scin γ 0° to 160°
sharp	(11.08)		
	(11.97)	($7/2^-$)	
	(12.5)	($1/2^-$)	

σ(for n_0, n_1, and γ production) given as f(E_α)
α,$n_0(\theta)$, α,$\gamma(\theta)$, nγ(θ) found for several E_α
Results are consistent with level energy and spin assignments above. No clear indication of stripping.

56J28 D.B.James, G.A.Jones, D.H.Wilkinson, Phil. Mag. 1, 949 (1956).

$C^{13}_{6\ 7}$

Level	Be^9(α,n_1γ)	E_α = 1.3 to 2.5
11.975 *10*	Γ = 0.09 *1*	scin γ

$\sigma(90°) = 26^{+26}_{-13}$ mb/sr for E_α = 1.92
α,γ(θ) for 6 E_α's given

$Be^9(\alpha,\alpha)^*$
No resonances observed
$\sigma(90°) \leq 2.6$ mb/sr for E_α = 1.9

55T28 N.W.Tanner, Proc. Phys. Soc. 68A, 1195 (1955); *G.Dearnaley, ibid.

Reaction γ's	$B^{(10)}$(α,pγ)	E_α = 2.3
	$C^{(12)}$(d,pγ)	E_d = 2.4
0.1695 4	α = 0.00014*3	sl ce,pe
3.67 *3*	τ < 0.3 μμs	Doppler shift
3.844 *15*	τ > 0.3 μμs	Doppler shift

No ~0.6γ (< 3% of 3.67 + 3.84γ) sl pe
For 3.84 level γ and p intensities show that (decays to 3.67 level)/(decays to g.s.) = 0.24
*Isotropy assumed

56M52 R.J.Mackin, Jr., W.R.Mills, Jr., J.Thirion, Phys. Rev. 102, 802 (1956); J. phys. radium 17, 551 (1956); Phys. Rev. 92, 529A (1953).

σ's	Be^9(α,n_o and n_1)	
Excitation = 11.8 to 14.2		
Cross section graphs given for		
α,n_o(0°,E) and α,n_1(0°,E)		scin, recoil s
α,n_o(θ, 2.0 < E_α < 5.1)		recoil s
α,n_1(θ, 4.0 < E_α < 5.1)		
Levels and spins not assignable		

57R38 J.R.Risser, J.E.Price, C.M.Class, Phys. Rev. 105, 1288 (1957).

$C^{15}_{6\ 9}$ 2.3^s

τ		2.25^s 5	C^{14}(≥1.3-Mev d,p)
β^-	80%	4.5 2	scin
	20%	9.5 *3*	
γ(N^{15})	100†	5.3	

No 1.9γ (<10†) No γ with E_γ > 5.3 (<5†)
2.25^s activity not produced by Li(d), N(d)
Thick Pr^{144} source used for F-K plot corrections

56D37 R.A.Douglas, B.R.Gasten, A.Mukerji, Can. J. Phys. 34, 1097 (1956); Bull. Am. Phys. Soc. 1, No. 1, 21 DA13 (1956).

$C^{15}_{6\ 9}$

Level	C^{14}(d,p)	EA 134°
g.s.	Q = −1.007 *1*	

No p groups to any levels from 0.35 to 0.50 (<5% of g.s. group). Region below 0.35 obscured by C^{12}(d,p). Possible level at 0.009.

56D41 R.A.Douglas, J.W.Broer, R.Chiba, D.F. Herring, E.A.Silverstein, Phys. Rev. 104, 1059 (1956).

$C^{15}_{6\ 9}$

Levels — $Be^9(Li^7,p)$ — E_{Li^7} = 2.0 VdG

10†	g.s.	Q=+9.05 5	a+scin 90°
21†	0.70 5		

57N14 E.Norbeck, Jr., Phys. Rev. 105, 204 (1957).

$N^{12}_{7\ 5}$

Levels — $B^{10}(He^3,n)$ — E_{He^3} = 2.54

σ = 5 2 mb	g.s.	Q=+1.46 6	[ppl 10 angles
	1.08	1.9?	
	1.53	2.35	

57A25 F.Ajzenberg-Selove, M.L.Bullock, E.Almqvist, Bull. Am. Phys. Soc. 2, No. 1, 28, J4 (1957); verbal report.

$N^{13}_{7\ 6}$

Levels — $C^{(12)}(d,n)$ — E_d = 9.0

$\sigma(0°)$mb/sr	Level	l_p	θ^2	
~39	g.s.	1	0.056	[scin,
~75	(2.37)	0		d,n(θ)
~270	[(3.51) (3.56)]	2	0.19*	

*If contribution of 3.51 level is neglected

57C02 J.M.Calvert, A.A.Jaffe, E.E.Maslin, Proc. Phys. Soc. 70A, 78 (1957).

Levels — $N^{(14)}(d,t)$ — E_d = 14.8

~4.0, 1.6†	g.s.	s+scin 18°, 24°
~0.01, 0.02†	(2.37)	
~0.2, 0.2†	(3.51+3.56)	

†$\sigma(18°)$, $\sigma(24°)$ respectively in mb/sr
No other level below 7.0 (<0.05†)

57W01 E.K.Warburton, J.N.McGruer, Phys. Rev. 105, 639 (1957).

Levels — $C^{(12)}(p,p)$ — E_p = 1.5 to 5.5

Level	J	Γ(c.m.)	θ^2	
[2.37	$1/2^+$	0.031	0.54	*
3.51	$3/2^-$	0.055	0.031	
3.56]	$5/2^+$	0.061	0.21	
6.383	$5/2^+$	0.011	0.0031	
6.90	$3/2^+$	0.115	0.012	

Phase shift analysis of $\sigma(E,\theta)$ made

$C^{(12)}(p,p'+4.43\gamma)$ E_p = 5.0 to 5.5

6.90 $\sigma(90°)$ = 0.016 4

p,$\gamma(\theta)$ consistent with $J = 3/2^+$ for this level
Suggest this state has 2^+ core with $s_{\frac{1}{2}}$ proton

56R39 C.W.Reich, G.C.Phillips, J.L.Russell, Jr., Phys. Rev. 104, 143 (1956); Bull. Am. Phys. Soc. 1, No. 2, 96 N9 (1956); *H.L. Jackson, I.Galonsky, Phys. Rev. 89, 365 (1953).

Level — $C^{(12)}(d,n)$ — E_d = 7.66

3.75 5	Q=−4.03	time-of-flight	

57G49 R.Grismore, W.C.Parkinson, Rev. Sci. Instr. 28, 245 (1957).

$N^{13}_{7\ 6}$

Levels — $C^{(12)}(p,p'\gamma)$ — $E_p \leq 6.40$; p,$\gamma(\theta)$

mb/sr(peak)	Level	E_o	Γ(kev)	J
(16)	6.912	5.362 7	~130	$3/2^+$
8	7.419	5.910 7	~85	$5/2^+$

57L32 L.J.Lidofsky, J.Weil, R.D.Bent, K.W. Jones, Bull. Am. Phys. Soc. 2, No. 1, 29 J11 (1957); verbal report.

Levels — $B^{10}(He^3,p)$ — E_{He^3} — 1.25 to 5.0 scin, 0° to 150°

Level	Γ
23.2	0.5
24.5	0.7
24.8	0.12
25.2	0.15

σ's given

$p_1/p_o \sim p_1/p_2 \sim 10$ for above E_{He^3}
For E_{He^3} = 2.1 to 4.7 $He^3,p_1(\theta)$ and $He^3,p_2(\theta)$ are 90°-symmetric; $He^3,p_o(\theta)$ is not

56S101 J.P.Schiffer, T.W.Bonner, R.H.Davis, F.W.Prosser, Jr., Phys. Rev. 104, 1064 (1956); Bull. Am. Phys. Soc. 1, No. 7, 324 E1 (1956).

σ's — $C^{(12)}(p,\gamma)$ (Excitation = 2.02 to 2.06 Mev) — scin

E_p	σ
0.080	1.4×10^{-11}b 4
0.126	6.8×10^{-10}b 8

57L05 W.A.S.Lamb, R.E.Hestler, Phys. Rev. 107, 550 (1957); Bull. Am. Phys. Soc. 2, No. 4, 181 E8 (1957).

Capture γ — $C^{(12)}(p,\gamma)$ — E_p = 0.4568 scin

2.37 J

56C75 D.R.Chick, W.W.Evans, D.A.Hancock, S.E.Hunt, R.A.Pope, Proc. Phys. Soc. 69A, 624 (1956).

$N^{14}_{7\ 7}$

Levels — $C^{14}(p,n)$ — E_p = 0.6 to 3.4

g.s.	Q = −0.6264 5		long counter 0°
2.3119 12			thresh n 0°

56S106 R.M.Sanders, Phys. Rev. 104, 1434 (1956).

Levels — $O^{(16)}(d,\alpha)$ — E_d = 5.5 to 7.5

100†	g.s.		s77 15° to 130°
7†	2.31*		

†Yields at E_d = 7.03 averaged over angle
*Forbidden transition explained by Coulomb mixing of T = 1 with T = 0 states

56B136 C.P.Browne, Phys. Rev. 104, 1598 (1956); 100, 1253A (1955).

$N^{14}_{7\ 7}$ Level $N^{(14)}(p,p'+2.31\gamma)$ $E_p = 2.5$ to 5

2.31 2 scin γ

$J = 0$ from $p,\gamma(\theta)$ at 4 E_p values

56B134 J.K.Bair, H.O.Cohn, J.D.Kington, H.B. Willard, Phys. Rev. 104, 1595 (1956).

Levels $N^{(14)}(\alpha,\alpha')$ $E_\alpha = 31.5$

<6† (2.31) scins dE/dx, E

100† (3.95) 15° to 64°

56W29 H.J.Watters, Phys. Rev. 103, 1763 (1956).

Levels $N^{(14)}(p,p')$ $E_p = 9.45$

5.69 3	ppl 60° to 140°
5.83 3	6.60? 4
5.95?	7.03 2
6.23 2	7.40 2
6.46 2	7.60 2

Levels at 5.10, 4.91, 3.95, 2.31 also noted but no evidence for one at 3.15

56B116 E.J.Burge, D.J.Prowse, Phil. Mag. 1, 912 (1956).

Level $C^{13}(p,\gamma)$ $E_p = 1.16$

(6.23) $J = 1,2$

$(2.4\gamma)(6.23\gamma)(\theta)$ consistent with either:

$J = 0,1,1$ with $6.23\gamma \sim$ pure E2 or pure M1

$J = 0,2,1$ with $6.23\gamma \sim$ pure M1

57G30 S.Gorodetzky, A.Gallmann, M.Croissiaux, R.Armbruster, Compt. rend, 244, 62 (1957); J. phys. radium 17, 550 (1956); Physica 22, 1160A (1956).

Level $C^{13}(p,\gamma)$ $E_p = 1.745$ to 1.750

$E_0 = 1.7469$ **9.164** $\Gamma = 0.510$ kev

Γ(corrected for Doppler broadening) < 0.40 kev

$\theta^2 < 1.5 \times 10^{-3}$ thick target; scin

56M87 J.B.Marion, F.B.Hagedorn, Phys. Rev. 104, 1028 (1956).

Levels $C^{13}(p,p)$ $E_p = 1.5$ to 3.4; VdG

E_0	Level	Γ(kev)	J	θ^2	
2.00 2	**9.39**	25 3	1^-	0.10	pc 45° to
2.12 2	**9.51**	32 6	3^-	0.11	149°
2.33 2	**9.72**	15 3	1^+	0.005	
2.90 4	**10.29**	80 30			
3.12 3	**10.51**	80 10			

Phase-shift analysis made

57Z02 D.Zipoy, G.Freier, K.Famularo, Phys. Rev. 106, 93 (1957); Bull. Am. Phys. Soc. 1, No. 1, 9 AB3; No. 7, 338 P3 (1956).

$N^{14}_{7\ 7}$ Levels $C^{(12)}(d,p_o)$ $E_d = 0.8$ to 1.7

Rel $\int\sigma d\theta$	Level	Γ(kev)	J^*	T^{**}	
85†	**11.04**	140	1^+	0	pc 20° to
30†	**11.23**	45	--	1	160°
330†	**11.26**	245	2^-	0	
68†	**11.38**	65	3^+	0	
100†	**11.49**$^\$$	15	3^+		

*From $d,p_o(\theta)$ and requirement that $\theta_p^2 \sim \theta_n^2$

**Suggested value $^\$$Also found in (d,p_1)

57S01 N.Sarma, M.Govindjee, H.R.Allan, Proc. Phys. Soc. 70A, 68 (1957).

Levels $C^{(12)}(d,\$)$ $E_d = 1.9$ to 3.4

E_o	Level	Γ(c.m.)	$\$ = d$	p_1	p_0	
2.502 7	**12.41**	0.040 3	•	•	•	
2.62 1	**12.51**	0.022 15		•	•	
2.735 6	**12.61**	0.047 3	•	•	•	
2.81 1	**12.67**	0.022 7	•			
2.954 7	**12.79**	0.017 8	•			
2.986 6	**12.82**	0.011 3	•			pc;
3.123 6	**12.94**	0.028 10	•			$\sigma(E,\theta)$
3.39 1	**13.17**	0.047 15	•			studied

*Resonances resolved Other anomalies found.

56M88 M.T.McEllistrem, K.W.Jones, R.Chiba, R.A.Douglas, D.F.Herring, E.A.Silverstein, Phys. Rev. 104, 1008 (1956); 99, 632A (1955); priv. comm.

σ's $C^{(13)}(p,\gamma)$

(Excitation $\sim$ 7.65 Mev)

E_p	σ	
0.114	5.1×10^{-9}b 20	scin
0.126	8.2×10^{-9}b 25	

57L05 W.A.S.Lamb, R.E.Hestler, Phys. Rev. 107, 550 (1957); Bull. Am. Phys. Soc. 2, No. 4, 181 E8 (1957).

Capture γ's $C^{13}(p,\gamma)$

8.06 level $E_p = 0.55$ thick scin

128†**	**1.61**			0°,90°
190†	**2.30**	18†	**4.91**	
20†	**3.13**	~11†	**(5.69)**	
25†	**3.38**	~25†	**(5.75)***	
131†	**4.11**	1000†	**8.06**	

*Change of E_γ with E_p shows this T-forbidden γ comes from the capture state. Author's estimated intensity assuming $(3.38\gamma)/(5.69\gamma) = 7/3$

**High due to $C^{12}(p,\gamma)$

57B125 C.Broude, L.L.Green, J.J.Singh, J.C. Willmott, Phil. Mag. 2, 499 (1957).

$N^{14}_{7\ 7}$

Capture γ's $C^{13}(p,\gamma)$

8.06 level		E_p = 0.55		scin pr
120†	4.14 9	22†*	(5.75)	
26†	(5.69)	1000†	(8.06)	

*48† found for composite 5.7 peak. At E_p = 0.70 2.51γ/2.31γ = 1.18 in (>4.5γ)γ spectrum.

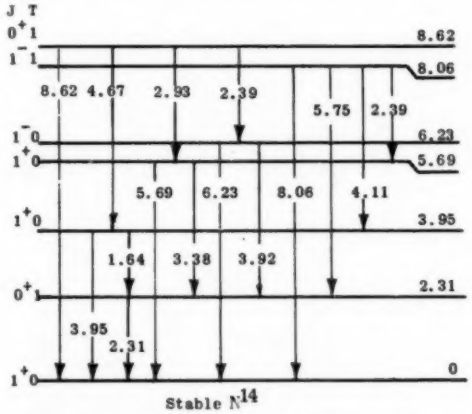
8.62 level			
	1.64 5	124†	3.87 7
470†	(2.31)	100†	4.60 9
	(2.39)	24†	(5.69)
54†	(2.93)	39†	(6.23)
33†	(3.38)	~95†	(8.62)

(~2.35γ)(1.64, ~2.35)
(~2.35γ)(3.9γ?)(~2.35γ)

γ's from 5.83 level not observed at above two resonances (no 0.725γ, no 5.10γ)

Relative strengths of the T-forbidden 5.75 and 6.23 γ's are 0.061 and 0.078 that of the allowed 8.06 and 3.87 γ's respectively. This suggests that each of the 8.06 and 6.23 levels is the chief T contaminator of the other

†Relative γ intensities for each level



Stable N^{14}

57W27 D.H.Wilkinson, S.D.Bloom, Phil. Mag. 2, 63 (1957).

Capture γ's $C^{13}(p,\gamma)$ E_p = 2.5 to 3.2

σ(mb)	10.43 level	
~0.07	4.03	
~0.07	6.42	
0.70 14	10.43	Γ = 30 3 kev; Γ_γ = 17 ev θ_p^2 = 0.02; J = 2 from p,$\gamma(\theta)$

p,(10.43 γ)(θ) consistent with J = 2$^-$, l = 2, S = 0, 1 or with J = 2$^+$, l = 3, S = 1. First preferred because of large Γ_γ. S = channel spin.

57W30 H.B.Willard, J.K.Bair, H.O.Cohn, J.D. Kington, Phys. Rev. 105, 202 (1957).

Reaction γ's $C^{(12)}(He^3,p)$ E_{He^3} = 1.3 to 2.0
(3.95γ)/(2.35γ) = 0.031 8 scin pγ

Level $B^{(10)}(\alpha,p,\gamma)$ VdG
12.697 E_α = 1.518 4 scin

57B118 D.A.Bromley, E.Almqvist, H.E.Gove, A.E.Litherland, E.B.Paul, A.J.Ferguson, Phys. Rev. 105, 957 (1957).

$N^{15}_{7\ 8}$

Level $C^{(13)}(He^3,p)$ E_{He^3} = 1.8 to 4.5
g.s. ppl; scin He^3,p(θ)

He^3,p(θ) are peaked in forward and backward directions, and change slowly with energy

57I02 E.G.Illsley, H.D.Holmgren, R.L. Johnston, E.A.Wolicki, Phys. Rev. 107, 538 (1957).

Levels $N^{(14)}(d,p)$ E_d = 14.8

mb/sr(peak)	Level	l_n	$(2J+1)\theta^2$	s + scin 0° to 95°
4.4	g.s.	1	0.097	
2.6	(6.33)	1	0.030	
17.5	(7.58)	0? + 2	0.06? + 0.40	
40	(8.32)	0	0.47	
2.4	(8.57)	0 + 2	0.18 + 0.031	

θ^2 agrees with shell model predictions

57W01 E.K.Warburton, J.N.McGruer, Phys. Rev. 105, 639 (1957); Bull. Am. Phys. Soc. 1, No. 7, 325 E10 (1956).

Levels $O^{(16)}(\gamma,p\gamma)$ E_γ = 20 to 27.5

(6.33)	9.0 2	scin γ
~7	~10	

No 5.3γ See also O^{15}

57S115 N.L.Svantesson, Nuclear Phys. 3, 273 (1957); Bull. Am. Phys. Soc. 1, No. 1, 28 GA3 (1956).

Levels $N^{(14)}(d,p)$ EA 134°

Level	Q	
7.301	+1.308	1.5
7.564	+1.045	1.5
8.313	+0.296	1
8.571	+0.038	1

56D41 R.A.Douglas, J.W.Broer, R.Chiba, D.F. Herring, E.A.Silverstein, Phys. Rev. 104, 1059 (1956).

Levels $C^{14}(p,n)$ E_p = 0.6 to 3.4; 0°

J	$\sigma(0°)$†	Level	Γ_n(kev)*	Γ_p(kev)*	Γ_α(kev)*
1/2	400	11.291 2	<1	>5	0
1/2	315	11.433 3	44	10	0
3/2	45	11.765 3	55	0.8	0
3/2	21	11.875 3	22	0.1	0.05
1/2	48	11.965 3	17	0.7	0.26
5/2	330	12.097 4	24	2.5	0.6
3/2	650	12.146 4	38	18	2.2
5/2	73	12.326 4	22.5	0.4	0.1
3/2		12.493 4	28	0.3	5.5

†mb/sr 12.920 4 *Data of others used

56S106 R.M.Sanders, Phys. Rev. 104, 1434 (1956).

$N^{16}_{7\ 9}$ 7.4^s

$N^{(15)}$(2.6-Mev d,p)

β^-	21 4%	3.28	s
	55 4%	4.27	
	24 2%	10.33 8	ΔJ = 2, yes shape

57W77 P.W.Morton, H.W.Lewis, Bull. Am. Phys. Soc. 2, No. 5, 286 L5 (1957).

$N^{16}_{7\ 9}$ 7.4^{s}

$\gamma(O^{16})$ 100† (6.133) $F^{19}(n,\alpha)$
8.1† (7.10) scin
$\sigma[C^{14}(d,\gamma)]/\sigma[O^{18}(d,\alpha)] < 0.003$ at $E_d = 1.16$

57B104 N.A.Bostrom, E.L.Hudspeth, I.L.Morgan, Phys. Rev. 105, 1545 (1957); Bull. Am. Phys. Soc. 1, No. 2, 94 M12 (1956).

$N^{16}_{7\ 9}$

Levels $N^{15}(d,p)$ $E_d = 14.8$

mb/sr(12.6°)	Level	l_n	$(2J+1)\theta^2$	s + scin
	g.s.	2	0.27	0° to 95°
	0.126 *15*	0	0.19	
	0.303 *9*	2	0.33	
	0.403 *15*	0	0.54	
0.90 *25*	3.53? *3*		Γ	13°, 18°, 30°, 60°
0.24 *3*	3.98 *2*			
~13	4.80 *5*		0.23 *5*	
~ 4	5.01? *5*		0.29 *5*	
~13	5.25 *5*			

57W01 E.K.Warburton, J.N.McGruer, Phys. Rev. 105, 639 (1957); Bull. Am. Phys. Soc. 1, No. 7, 325 E10 (1956).

Levels $N^{15}(d,p)$ $E_d = 2.75$ d,p(θ)

Level	l_n
(0.113)	0
(0.300)	2
(0.391)	0

56Z03 W.Zimmerman, Jr., Phys. Rev. 104, 387 (1956).

Level $N^{15}(n)$ $E_n = 2.8$ to 3.3
5.27 $\Gamma = 0.14$ *4*
$J = 2^-$ or $3^\pm$ from $\sigma_{max} - \sigma_{min}$ for resonance

56B109 E.Baumgartner, W.Franzen, P.Huber, L.Schellenberg, F.Seiler, Helv. Phys. Acta 29, 255 (1956).

Levels $C^{14}(d,p)2.3^{s}C^{15}$ $E_d = 1.3$ to 3.0 scin 90°

Level	Γ(c.m.)
12.2	0.270
12.6	0.190
12.8	0.165

56D37 R.A.Douglas, B.R.Gasten, A.Mukerji, Can. J. Phys. 34, 1097 (1956); Bull. Am. Phys. Soc. 1, No. 1, 21 DA13 (1956).

Reaction γ's $N^{15}(d,p\gamma)$ $E_d = 2.6$ to 2.9

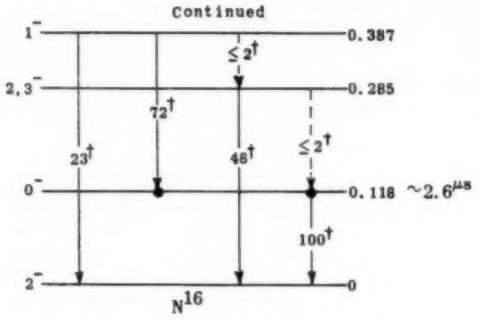
100 *10*†	0.118 *3*	scin γ
	~0.165?	
156 *15*†	0.268 *5*	scin γγ
	0.285 *8*	scin γ
27 *5*†	0.387 *5*	

†Measured intensities. Values on level scheme are from integration of Zimmerman's* results.
(0.268 γ)(0.118 γ) delay ~$2.6^{\mu s}$ *10*
Spin assignments based on intensities and delay

Continued

$N^{16}_{7\ 9}$

Continued



57W28 D.H.Wilkinson, Phys. Rev. 105, 686 (1957); *Phys. Rev. 104, 387 (1956).

O^{0}_{8}

Relative isotopic abundances ms
No O^{14}, O^{19}, O^{20} (<0.005%)
No O^{15} (<0.003%)

57K09 L.Kerwin, D.E.McElcheran, M.Cottin, Can. J. Phys. 35, 783 (1957).

$O^{14}_{8\ 6}$

Level $C^{(12)}(He^3,n)$ $E_{He^3} = 1.3$ to 2.7
g.s. $Q = -1.1585$ *30* thresh n

57B118 D.A.Bromley, E.Almqvist, H.E.Gove, A.E.Litherland, E.B.Paul, A.J.Ferguson, Phys. Rev. 105, 957 (1957).

$O^{15}_{8\ 7}$ 2.1^{m}

τ **2.066**^{m} *8* $O^{(16)}(\alpha,\alpha n)$

57P12 J.R.Penning, F.H.Schmidt, Phys. Rev. 105, 647 (1957).

τ **2.03**^{m} *8* $N^{(14)}$(3-Mev d,n)
β^+ **1.727** *5* Av. from 2 iron-free s
F-K linear ($E_\beta > 0.7$)

57K22 O.C.Kistner, A.Schwarzschild, B.M. Rustad, D.E.Alburger, Phys. Rev. 105, 1339 (1957).

$O^{15}_{8\ 7}$

Level $N^{(15)}(p,n)$ thresh n
g.s. $Q = -3.5418$ *14*

57L33 L.Lidofsky, J.Weil, K.Jones, Bull. Am. Phys. Soc. 2, No. 4, 182 E13 (1957).

Level $N^{(14)}(d,n)$ $E_d = 1.96$
$\sigma = 38$ *7*mb g.s. $Q = +5.13$ *5* ppl d,n(θ)
$l_p = 1$

57N16 I.Nonaka, S.Morita, N.Kawai, T. Ishimatsu, K.Takeshita, Y.Nakajima, N.Takano, J. Phys. Soc. Japan 12, 841 (1957); 11, 1 (1956).

$O^{15}_{8\ 7}$ Levels $O^{(16)}(\gamma,n\gamma)$ E_γ = 20 to 27.5 scin γ

(6.14)

No 5.3γ See also N^{15}

57S115 N.L.Svantesson, Nuclear Phys. 3, 273 (1957); Bull. Am. Phys. Soc. 1, No. 1, 28 GA3 (1956).

Level $N^{(14)}(p,p)$ E_p = 0.22 to 0.65

$N^{(14)}(p,\gamma)$ s 90°, 129°, 150°

7.605 E_0 = 0.2781 4 scin γ

J = 1/2

Γ = 0.0016 3

$p_\gamma(0.75\ 1.35\gamma)(0°) \simeq p_\gamma(0.75,\ 1.35\gamma)(90°)$

56C09 J.C.Overley, R.E.Pixley, W.Whaling, Bull. Am. Phys. Soc. 1, No. 8, 387 L3 (1956); verbal report.

Level $N^{(14)}(p,\gamma_0)$ E_p = 1.060

(8.34) J = 3/2 scin pr

$p,\gamma_0(\theta) = 1 + (0.050\ 10)P_2$

57H03 F.B.Hagedorn, F.S.Mozer, T.S.Webb, W.A. Fowler, C.C.Lauritsen, Phys. Rev. 105, 219 (1957).

Levels $N^{(14)}(p,p)$ E_p = 0.62 to 1.62 s 90° to 160° c.m.

$\omega\Gamma_\gamma$*	Level	Γ(kev)	θ^2	l	J
2/3 x 0.59	8.331 3	3 1	0.0029	0	$3/2^+$
1/3 x 0.33	8.788 6	34 4	0.016	0	$1/2^+$
0.076	8.968 4	4 1	0.0013	0?	$\leq 5/2$
			0.017	2?	
2/3 x 0.45	9.026 5	4 1	0.0028	1	$3/2^-$
1/3 x 0.90					$1/2^-$

Assumed s-wave potential scattering

*Statistical weight factor x Γ_γ calculated from Duncan, Perry data and above Γ's

57G38 S.Gorodetzky, A.Gallmann, M.Croissiaux, R.Armbruster, Nuclear Phys. 4, 112 (1957); Compt. rend. 244, 1759 (1957).

Levels $N^{(14)}(p,p)$ E_p = 1.5 to 3.5

8.79 1	pc 39° to 140° c.m.	9.67 1	
8.97 1		9.73	broad
9.03 1		10.33 1	
9.55 1		10.52 1	
9.62?			

$\sigma(\theta,E)$ given. Gas target used.

57B113 C.R.Bolmgren, G.D.Freier, J.G.Likely, K.F.Famularo, Phys. Rev. 105, 210 (1957); Bull. Am. Phys. Soc. 1, No. 7, 339 P4 (1956).

$O^{15}_{8\ 7}$ Levels $N^{(14)}(p,p')$ E_p ~1 to 4.1

Level	Γ(kev)	J	
9.713	<8		90° to 168° c.m.
10.95*	85	≥3/2	from $p,p'(\theta)$
11.062*	<15		

*Also (p,p') resonances for N^{14} 2.31 level

Gas target used

57C02 J.W.Olness, J.Vorona, H.W.Lewis, Bull. Am. Phys. Soc. 2, No. 1, 51 RA6 (1957); verbal report.

Levels $N^{(14)}(p,p'+2.31\gamma)$ E_p = 2.5 to 5 scin 0°, 90°

$\sigma(90°)$ = 3.9 6 mb/sr

Level	Γ(kev)
11.00 1	90
11.08 1	25
11.83 2	80
11.91 1	70

56B134 J.K.Bair, H.O.Cohn, J.D.Kington, H.B. Willard, Phys. Rev. 104, 1595 (1956).

Levels $C^{(12)}(He^3,p)$ E_{He^3} = 1.3 to 2.7

$C^{(12)}(He^3,n)$ scin, BF_3 90°

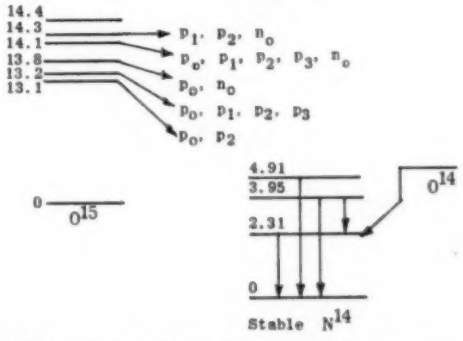
E_0	Level	J^π
1.21*	13.10 2	$5/2^-, 3/2^+$
1.31*	13.2	$1/2^-$
2.15**	13.8	>5/2
2.52**	14.1	$1/2^+$
2.7 **	14.3	
~2.9 *	14.4	

*p resonances

**p and n resonances

$^\pi$from p, γ, and n yields $He^3,p(\theta)$; $He^3,n(\theta)$ at several E_{He^3} not typical of either compound nucleus or stripping

Relative and absolute σ's given



57B118 D.A.Bromley, E.Almqvist, H.E.Gove, A.E.Litherland, E.B.Paul, A.J.Ferguson, Phys. Rev. 105, 957 (1957).

Levels $C^{(12)}(He^3,p)$ E_{He^3} = 2.0 to 3.8

Level	p group	Γ	7° to 150°
13.82	p_0(W)	<0.1	
14.08	p_0(W), p_1	~0.2	
14.3	p_1	~0.2	
14.48	p_0, p_1	~0.2	
15.0	p_0	~0.2	

56H65 H.D.Holmgren, E.H.Geer, R.L.Johnston, E.A.Wolicki, Bull. Am. Phys. Soc. 1, No. 7, 325 E8 (1956)

$_{8}O^{16}_{8}$ Levels $F^{19}(p,\alpha)$ E_p = 7.0, 7.3; s

g.s.	Q = +8.110 *10*	60°, 90°, 130°
6.051 *10*	8.874 *12*	
6.131 *10*	9.852 *12*	Γ
6.920 *10*	10.363 *14*	25 to
7.120 *10*	11.085 *14*	30kev

Γ < 20kev for levels from 6.051 through 9.852
Two unassigned peaks just below 11.085 peak
No other α groups (< 5% of 8.874-level group)

56S95 G.L. Squires, C.K. Bockelman, W.W. Buechner, Phys. Rev. 104, 413 (1956).

Level $F^{19}(p,\alpha\pi)$ E_p = 2

6.065 *9* sl pr

56A43 D.E. Alburger, Rev. Sci. Instruments 27, 991 (1956).

Levels $F^{19}(p,\alpha)$ E_p ~5

Level	Q	sπ 180°
(6.06)	+2.061 *15*	
(6.14)	+1.981 *8*	
(6.91)	+1.193 *8*	
(7.12)	+0.997 *8*	
(8.87)	−0.763 *8*	

57Y01 T.E. Young, G.C. Phillips, R.R. Spencer, Bull. Am. Phys. Soc. 2, No. 2, 104 J6 (1957).

Level $F^{19}(p,\alpha\gamma)$

(6.14) $\tau = 6.4^{\mu\mu s}$ *28* recoil

56K36 D. Kohler, H. Hilton, Bull. Am. Phys. Soc. 1, No. 8, 390 M10 (1956).

Levels $N^{15}(d,n)$ $E_d \geq 1.1$ VdG

10.937 *10* thresh n ~ 0°
11.063 *15*

57W19 J. Weil, K.W. Jones, L.J. Lidofsky, H. Smotrich, J. Baicker, Bull. Am. Phys. Soc. 2, No. 1, 52 RA7 (1957).

Levels $N^{15}(p,p)$ E_p = 0.65 to 1.80

s 90°, 129°, 150°

Level	J	Γ
12.776* *7*	0^-	0.040* *4*
12.930	2^-	
13.074	1^-	0.140 *7*
13.344	3^-	
13.647	1^+	

*From measurement of $N^{15}(p,\gamma)$ resonance

56H74 F.B. Hagedorn, Bull. Am. Phys. Soc. 1, No. 8, 387 L4 (1956); verbal report.

$_{8}O^{16}_{8}$ Level $N^{15}(p,\gamma_0)$ E_p = 0.85 to 3.30

Level	E_0	Γ(kev)	scin
13.09	1.050 *10*	125 *25*	

All γ's directly to g.s.
Any other capture resonance < 2% of 1.05 resonance

57B03 S. Bashkin, R.R. Carlson, Phys. Rev. 106, 261 (1957); 100, 1254A (1955); Bull. Am. Phys. Soc. 1, No. 4, 211 SA7 (1956).

Level $N^{15}(p,\gamma)$ E_p = 1.0 to 4.0

13.09 scin

No other resonance seen. $p,\gamma(\theta)$ isotropic (±10%)

57W29 D.H. Wilkinson, S.D. Bloom, Phys. Rev. 195, 683 (1957).

Levels $N^{15}(p,\alpha\gamma)$ E_p = 0.80 to 4.02

scin 4.43γ, $p,\gamma(\theta)$

σ_0(mb)	Level	E_0	Γ(kev)	J
(425 *85*)	13.24	1.210 *10*	25 *5*	$3^-,4^+$
340 *68*	13.66	1.650 *15*	65 *10*	$1^+,2^-$
35 *10*	13.97	1.985 *20*	25 *5*	2^-
600 *180*	14.92	3.000 *30*	45 *10*	4^+
270 *80*	15.20	3.300 *35*	75 *15*	$2^-,3^+$
205 *60*	15.25	3.350 *50*	750 *100*	2^+
80 *24*	15.41	3.520 *40*	100 *25*	$1^-,2^+$ / $3^-,4^+$

No 14.2, 14.7 levels

57B03 S. Bashkin, R.R. Carlson, Phys. Rev. 106, 261 (1957); 100, 1254A (1955); Bull. Am. Phys. Soc. 1, No. 4, 211 SA7 (1956).

Levels $O^{(16)}(\gamma,p)$ $E_\gamma \leq 25$; ppl

14.7	If all p's to N^{15} g.s.
~17	
2† 19.6	E_p's show p's to N^{15} g.s.
2† 20.6	
20† 22.4	

†Approximate $\int \sigma dE$ in Mev-mb
$\gamma,p(\theta)$ for E_p = 6 to 12 has max at ~90°

56C59 L. Cohen, A.K. Mann, B.J. Patton, K. Reibel, W.E. Stephens, E.J. Winhold, Phys. Rev. 104, 108 (1956).

Levels $N^{15}(p,n)$ E_p = 3.7 to ~6

Level	Γ(kev)	Level	Γ(kev)
16.21	24	17.63	70
16.3	~250	17.84	105
17.12	44	17.97	52
17.29	90	18.05	40

Threshold = 3.776 *7* BF_3 0°, 90°

57J11 K.W. Jones, L.J. Lidofsky, J. Weil, Bull. Am. Phys. Soc. 2, No. 1, 52 RA9 (1957); verbal report.

$_{8}O^{16}_{8}$ Levels $O^{(16)}(\gamma,p)$ $E_\gamma \lesssim 30, \lesssim 35, \lesssim 70$ ppl

w	20.7	If all p's to N^{15} g.s.
st	21.9	
w	24.0	

$\int \sigma dE$ (for E_γ = 20 to 25) = 20 Mev-mb

$\gamma, p(\theta)$ for $E_p > 7.5$ has max at ~90°

56L30 D.L.Livesey, Can. J. Phys. 34, 1022 (1956).

Reaction γ's $F^{19}(p,\alpha\gamma)$ E_p = 5.2 to 6
$N^{15}(d,n\gamma)$ E_d = 4.5
3.86 *3* scin pr
8.87

(3.86 γ)(7.12γ), no other (3.86γ)γ indicating O^{16} 0⁻ level at 10.98

(8.87γ)/(2.73γ) = 0.06 *3*

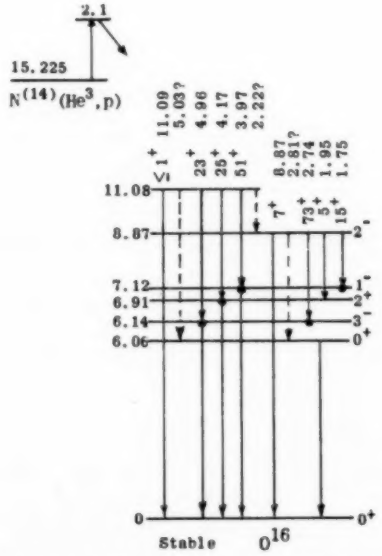
No strong γ's with $7.5 < E_\gamma < 11.5$

57B42 R.D.Bent, T.H.Kruse, L.J.Lidofsky, K.E.Eklund, Bull. Am. Phys. Soc. 2, No. 1, 52 RA8 (1957); verbal report.

Reaction γ $C^{12}(\alpha,\gamma_0)$ E_α ~3.24
9.58 level Γ_{γ_0} = 6 mev scin

T-forbidden 9.58γ observed

57B101 S.D.Bloom, B.J.Toppel, D.H.Wilkinson, Phil. Mag. 2, 57 (1957).



+Relative photon intensities from each level

57B117 D.A.Bromley, A.J.Ferguson, H.E.Gove, A.E.Litherland, E.Almqvist, Bull. Am. Phys.Soc. 2, No. 1, 51 RA4, RA5 (1957); verbal report.

$_{8}O^{16}_{8}$ Resonance $C^{13}(He^3,p)$ E_{He^3} = 1.25 to 5.0
peaks (Excitation ~26 Mev)
3.6 Γ = 0.5
σ's given 4.5 Γ = 0.4 scin 0° to 150°

$He^3, p_0(\theta)$ not 90°-symmetric for E_{He^3} = 2.2 to 4.5

56S101 J.P.Schiffer, T.W.Bonner, R.H.Davis, F.W.Prosser, Jr., Phys. Rev. 104, 1064 (1956).

Resonance peak $C^{13}(He^3,p_0)$ E_{He^3} = 2.0 to 3.8
$C^{13}(He^3,\alpha_0)$ 0° to 150°
w 3.6 broad

Angular distributions not symmetric about 90°

56W32 E.A.Wolicki, H.D.Holmgren, R.L. Johnston, E.H.Geer, Bull. Am. Phys. Soc. 1, No. 7, 325 E5 (1956).

$_{8}O^{17}_{9}$ Ground state HDO
q −0.026 *9* Mic

q of Geschwind et al.* believed too small due to incorrect amount of hybridization of oxygen orbitals in OCS

57B93 M.J.Stevenson, C.H.Townes, Phys. Rev. 107, 635 (1957); Bull. Am. Phys. Soc. 2, No. 1, 31 JA6 (1957). *Geschwind et al. Phys. Rev. 85, 474 (1952).

Level $C^{14}(\alpha,n)$ E_α = 2.335 to 2.355
g.s. Q = −1.820 *2* thresh n

56S106 R.M.Sanders, Phys. Rev. 104, 1434 (1956).

Levels $O^{(16)}(d,p)$ E_d = 3.4 to 4.2 ic d,p(θ)

Level	l_n
g.s.	2*
(0.872)	0*

*σ at large angle exceeds Butler theory and is sensitive to E_d. σ for 0.872 level is sensitive to E_d even at small angles.

57B14 E.Baumgartner, H.W.Fulbright, Phys. Rev. 107, 219 (1957).

Levels $O^{(16)}(d,p)$ E_d = 4.32

st	g.s.	Q = + 1.885 *15*	s ~110°
st	0.893 *15*		
w	3.005 *15*		
w	3.853 *15*		

55K35 L.M.Khromchenko, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 277 (1955), Columbia Tech. Transl. p.252; Doklady Akad. Nauk SSSR 93, 451 (1953).

$O^{17}_{8\ 9}$

Level $O^{16}(d,p)$ $E_d = 0.999$ VdG

0.869 $Q = +1.0490$ *22* s 135°

No evidence for doublet structure
(Second group <3%, 6% of main group for $\Delta Q \geq 10$, 6 kev respectively)

57M76 F.S.Mozer, F.B.Hagedorn, Phys. Rev. 105, 1270 (1957).

Levels $O^{(16)}(d,p)$ EA 134°

0.870 $Q = +1.048$ *2*

0.881*

*May be due to contaminant

56D41 R.A.Douglas, J.W.Broer, R.Chiba, D.F. Herring, E.A.Silverstein, Phys. Rev. 104, 1059 (1956).

Levels $O^{(16)}(d,p)$ $E_d = 7.1, 7.5$

Level	Γ(kev)	s 30°,60°,90° Level	Γ(kev)
4.553 *8*	42		
5.083 *10*	104	5.695 *6*	<8
5.215 *6*	<8	5.731 *6*	<8
5.378 *10*	20	5.866 *6*	<8

57B116 C.P.Browne, Bull. Am. Phys. Soc. 2, No. 1, 52RA10 (1957); verbal report.

Levels $O^{(16)}(n,\alpha)$ n's from Li(d,n)

6.89 *4*	8.27 *3*	ic
7.09?	8.41?	
7.16?	8.52 *3*	
7.28?	8.75 *3*	
7.39?	8.90 *3*	
7.57?	9.07 *3*	
7.75 *3*	9.21?	
7.93 *3*	9.45?	
8.06 *3*	9.66?	

Measured distribution of $E_\alpha + E_{C^{13}}$
Assumed $Q = -2.201$

56K41 K.Kimura, I.Kumabe, K.Miyake, H.Ogata, K.Miyasita, J. Phys. Soc. Japan 11, 1211 (1956).

Levels $C^{13}(\alpha,n)$ $E_\alpha = 1.0$ to 2.5; scin

J	Level	Γ(kev)	Γ_α(kev)	0° to
5/2(?)	7.16 *1*	3.5 *10*	0.016 *3*	167°
5/2(?)	7.37 *1*	≤2	0.038 *6*	
	7.50 *1*	7 *3*		
	7.67 *2*	20 *10*		
	7.92 *3*	~100		
	8.04 *3*	~80		
≤5/2	8.18* *3*	60 *15*	10 *4* or 36 *9*	

$\alpha,n(\theta)$ given for all except 7.92, 8.04 levels
J from $\alpha,n(\theta)$, Γ_α from $\int \sigma dE$
*$\sigma(0°) = 36$ *10* mb/sr

56R44 M.G.Rusbridge, Proc. Phys. Soc. 69A, 830 (1956).

$O^{17}_{8\ 9}$

Levels $C^{13}(\alpha,n)$ $E_\alpha = 2$ to 5; $\alpha,n(\theta)$ long counter, scin

Level	J	Level	J
(7.94)	$1/2^\pm$	(8.95)	$(7/2^\pm)$
(8.07)	$3/2^\mp$	(9.20)	5/2
(8.20)	$3/2^\pm$	(9.50)	7/2
(8.40)	5/2	(9.73)	7/2
(8.50)	5/2, (3/2)	(9.89)	9/2
(8.70)	$3/2^\pm$	(9.97)	(5/2, 7/2)
(8.89)	$3/2^\mp$		

Parities are determined only relative to adjacent levels

57S20 J.P.Schiffer, A.A.Kraus, Jr., J.R. Risser, Phys. Rev. 105, 1811 (1957); Bull. Am. Phys. Soc. 1, No. 4, 211 SA3 (1956).

Levels $N^{15}(d,p)$ $E_d = 0.3$ to 3

σ	Level	
0.442	15.18	7.4^5N^{16}
0.670	15.69	

57B104 N.A.Bostrom, E.L.Hudspeth, I.L.Morgan, Phys. Rev. 105, 1545 (1957); Bull. Am. Phys. Soc. 1, No. 2, 94 M12 (1956).

Reaction γ's $F^{19}(d,\alpha\gamma)$ $E_d = 1.2$ αγ

2.2

3.81

No 3.06γ
0.66, 0.92, 1.12, 1.47γ's observed in coincidences that could be either pγ or αγ

56G60 S.Gorodetsky, T.Muller, M.Port, Physica 22, 1159A (1956).

$O^{18}_{8\ 10}$

Levels $F^{19}(n,d)$ $E_n = 14.1$ pc + scin, n,d(θ)

Level	l_p	θ_p^2
g.s.	0	~0.012
1.9 *1* (0)		<0.0005*
1.9 *1* (1)		<0.002*
1.9 *1* (2)		<0.01*

g.s. $Q = -5.79$ *8* No 2.45 level
*Approximate upper limits for assumed l_p

57R40 F.L.Ribe, Phys. Rev. 106, 767 (1957); 100, 1254A (1955).

Levels $O^{17}(d,p)$ $E_d = 7.8$ d,p(θ)

Level	l_n
g.s.	2
(1.98)	0, 2
(3.56)	2

56B115 O.M.Bilaniuk, Bull. Am. Phys. Soc. 1, No. 7, 326 G3 (1956).

O^{18} 8 10

Levels $F^{19}(t,\alpha)$ $E_t = 1.5, 1.802$

$\sigma(0°) =$ 0.072 mb/sr

1.989 *24*		sd 90°
3.504 *34*	5.311 *40*	
3.929 *40*	5.456 *40*	
5.007 *40*	6.190 *40*	
5.170 *40*	6.328 *40*	

Region from 4.42 to 4.47 obscured by $O^{16}(t,\alpha)$

56J31 N.Jarmie, Phys. Rev. 104, 1683 (1956); Bull. Am. Phys. Soc. 1, No. 1, 28 GA4 (1956).

Levels $C^{14}(\alpha,n)$ $E_\alpha = 2.3$ to 3.6

Level	Γ(kev)	scin 0°
8.223 *4*	1.6 *1*	
8.293 *3*	10 *1*	$J = 1,\bar{3}^-$ from
8.414? *11*	22 *10*	$\alpha,n(\theta)$
8.832 *15*	100 *20*	
8.966 *4*	54 *3*	

$\sigma = 0.30$

56S106 R.M.Sanders, Phys. Rev. 104, 1434 (1956).

O^{19} 8 11

Level $O^{18}(d,p)$ $E_d = 4.98$

g.s. $Q = +1.734$ *5* sπ 180°

57A19 K.Ahnlund, Arkiv Fysik 11, 379 (1957).

O^{20} 8 12

τ $< 10^m$ or $> 150^y$ $O^{18}(40\text{-Mev } \alpha, 2p)$

Assumed $\sigma[O^{18}(\alpha,2p)] \geq 0.1\ \sigma[Mg^{26}(\alpha,2p)]$

56K37 S.Katcoff, J.Hudis, J. Inorg. Nuclear Chem. 3, 253 (1956).

F^{17} 9 8

Levels $O^{(16)}(d,n)$ $E_d = 7.6$

3.03 *6* time-of-flight

4.74 *7*

57G49 R.Grismore, W.C.Parkinson, Rev. Sci. Instr. 28, 245 (1957).

F^{18} 9 9 1.9^h

$\epsilon_K/\beta^+ = 0.030$ *2* pc e_A/β^+

No γ (< 0.005 per β^+) scin

$C_A/C_T = 0.004$ *20* from ϵ_K/β^+

56D38 R.W.B.Drever, A.Moljk, J.Scobie, Phil. Mag. 1, 942 (1956).

F^{18} 9 9

Levels $F^{19}(p,d)$ $E_p = 18.6$; pc, scin

g.s.	$l_n = 0$	p,d(θ)
0.94		
1.07		
1.69		

57B49 E.F.Bennett, Bull. Am. Phys. Soc. 2, No. 4, 208 P10 (1957); verbal report.

F^{18} 9 9

Levels $F^{19}(d,t)$ $E_d = 8.90$ ppl d,t(θ)

Level	l_n	
g.s.	0	Q = -4.17 *2*
0.94 *2*	1	
1.07 *2*	0	

57E12 F.A.El Bedewi, I.Hussein, Proc. Phys. Soc. 70A, 233 (1957).

Levels $O^{17}(p,\alpha)$ $E_p = 1$ to 3

$\sigma(90°)$	Level	E_o	Γ(c.m.)	
0.7†	6.666	1.110	0.009	sd 90°
1.2†	6.820	1.273	0.09	
1.1†	7.304	1.786	~0.065	
2.3†	7.527	2.021	0.011	
1.5†	7.552	2.048	0.09	
1.4†	7.713	2.218	0.011	
1.3†	7.728	2.235	0.10	
3.7†	7.889	2.406	~0.025	
2.9†	7.917	2.435	~0.025	
1.1†	8.094	2.623	~0.04	
1.4†	8.216	2.753	~0.015	
2.0†	8.238	2.775	~0.010	
0.9†	8.382	2.928	~0.05	

†Relative σ

57A20 K.Ahnlund, Phys. Rev. 106, 124 (1957).

Levels $O^{(16)}(d,\alpha)$ $E_d = 3.8$ to 4.2 ic d,α(θ)

E_o	Level	Γ
~3.85	~10.95	~0.10
~4.00	~11.09	~0.035

57B14 E.Baumgartner, H.W.Fulbright, Phys. Rev. 107, 219 (1957).

Levels $O^{(16)}(d,d)$ $E_d = 4.6$ to 7.2

Yield at 130° shows 8 peaks; yield at 90° 5 at E_d's slightly higher than those for 130°

56B135 D.W.Berger, O.J.Loper, Phys. Rev. 104, 1603 (1956).

Levels $O^{(16)}(d,\alpha)$ $E_d = 5.5$ to 7.5

Yield curves for $\alpha_0, \alpha_1, \alpha_2$ show broad peaks

56B136 C.P.Browne, Phys. Rev. 104, 1598 (1956); 100, 1253A (1955).

F^{19} 9 10

Ground state

μ +2.6117 I

56S111 A.K.Saha, B.M.Banerjee, T.P.Das, D.K. Roy, S.K.Gosh Roy, T.Ghose, Indian J. Phys. 30, 211 (1956).

F^{19} 9 10

Levels	$F^{19}(p,p')$	E_p = 7.0, 7.3 s
		60°, 90°, 130°
	0.111 2	
	0.197 2	2.784 8
	1.350 5	3.912 10
	1.462 5	4.002 10
	1.558 5	4.036 10

56S95 G.L.Squires, C.K.Bockelman, W.W. Buechner, Phys. Rev. 104, 413 (1956).

Levels	$F^{19}(p,p')$	E_p ~5
		sπ 180°
	1.344 5	
	1.458 5	
	1.554 5	

57Y01 T.E.Young, G.C.Phillips, R.R.Spencer, Bull. Am. Phys. Soc. 2, No. 2, 104 J6 (1957).

Levels	$O^{18}(p,\alpha)$		E_p = 0.77 to 3.54
			pc 90°
	8.749 6		
	8.883 4	9.856 4	10.524 5
	9.159 10	10.016 4	10.576 5
	9.287 4	10.070 5	10.606 6
	9.491 4	10.094 5	10.730 5
	9.554 4	10.125 5	10.825 6
	9.600 5	10.208 5	10.858 6
	9.623 4	10.276 5	10.953 6
	9.787 4	10.451 5	11.245 6

56H67 H.A.Hill, J.M.Blair, Phys. Rev. 104, 198 (1956); 100, 961A (1955).

Levels	$O^{18}(p,n)$		E_p = 2.5 to 3.54
	Level	Γ	long counter
			0°
	10.465 5	0.010 3	
	10.537 5		
	10.581 5	<0.020	
	10.832 5	0.033 3	
	10.951 6	0.018 6	
	11.047 6	0.029 3	
	11.163 6	0.015 3	
	11.235 6		

56H67 H.A.Hill, J.M.Blair, Phys. Rev. 104, 198 (1956); 100, 961A (1955).

Levels	$O^{18}(p,\alpha)$	E_p = 2.6 to 4.3
		pc 90°
~1†	11.45	
~1†	11.53	
~1†	11.65	

Lower levels agree with those of Hill,Blair

57S118 D.Szteinsznaider, M.Roclawski-Conjeaud, V.Naggiar, Compt. rend. 244, 445 (1957).

σ	$O^{18}(p,n)$	E_p = 10,40
	Excitation = 8 to 48	stacked foils

Many peaks for thin foils, E_p <10. For thick foils σ has max (0.426 4) at E_p = 5.6 6

56T21 Y.S.Tsai, Bull. Am. Phys. Soc. 1, No. 7 327 G4 (1956).

F^{19} 9 10

Reaction γ's	$F^{19}(N^{14},N^{14}'\gamma)$	$E_{N^{14}}$ = 15.6
		scin
	0.125 2	
	0.205 4	

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

Reaction γ $F^{19}(p,p'\gamma)$ E_p = 0.71 to 0.76

Nonresonant yield of 0.198γ is just the amount expected from E2 Coulomb excitation

56T27 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 989 (1956).

Reaction γ's	$F^{19}(n,n'\gamma)$	E_n = 3.2 to 3.7
		scin
	1.24	
	1.36	
100†	2.594 15	

No 2.68, 2.79 γ's (<10†)

57F22 J.M.Freeman, Phil. Mag. 2, 628 (1957).

P^{20} 9 11

Levels	$F^{19}(d,p)$	E_d = 3.5 to 4.1
g.s.	no stripping*	ic d,p(θ)
(0.65)	$l_n = 2$	$(2J_f+1)\theta^2 = 0.10$

*d,p(θ) is very different from Butler curve, and is sensitive to E_d. $J = 1^+$ is doubtful.

57S33 F.D.Seward, I.Slaus, H.W.Fulbright, Phys. Rev. 107, 159 (1957); Bull. Am. Phys. Soc. 2, No. 1, 52 RA12 (1957).

Levels	$O^{18}(d,\alpha)$		E_d = 0.3 to 3
σ	Level	Γ	
0.070	13.69	0.5	$7.4^{s}N^{16}$
0.079	13.91	0.4	
0.072	14.27	0.3	
0.089	14.94	0.6	

57B104 N.A.Bostrom, E.L.Hudspeth, I.L.Morgan, Phys. Rev. 105, 1545 (1957); Bull. Am. Phys. Soc. 1, No. 2, 94 M12 (1956).

Resonances	$F^{19}(n)$	Li(p,n)
	(Excitation ~6.6 Mev)	
	E_o(kev) J (from σ)	
	27 2^-	
	49 1^-	
	100 1^-	

57M46 E.Merzbacher, H.W.Newson, P.W.Crutchfield, W.Haberli, Bull. Am. Phys. Soc. 2, No. 1, 33 K8, K9 (1957); verbal report.

$F^{21}_{9\ 12}$ Levels $F^{19}(t,p)$ $E_t = 1$ to 2

g.s.	Q = +6.200 25	sd 90°
0.269 40		
1.087 40		
1.694 40		
2.036 40		

Region from 1.80 to 1.87 obscured by $C^{12}(t,p)$

56J31 N.Jarmie, Phys. Rev. 104, 1683 (1956). 99, 1043 (1955); Bull. Am. Phys. Soc. 1, No. 1, 28 GA4 (1956).

$Ne^{20}_{10\ 10}$ Levels $F^{19}(p,p)$ s, 4 angles

E_σ	Level	J	Γ(kev)	Γ_p/Γ
(0.669)	(13.505)	1^+	7.5	0.98
(0.842)	(13.670)	0^+	23	0.99
(0.874)	(13.700)	$2^-(1^-)$		$\ll 1$
(0.935)	(13.758)	1^+		0.1
(1.346)	(14.149)	$2^-(1^-)$		$\ll 1$
(1.372)	(14.173)	$2^-(1^-)$		$\ll 1$
(1.422)	(14.221)	1^+	15	0.85
(1.940)	(14.713)			$\ll 1$

Other small anomalies at $E_p = 1.690$, 2.030
No anomalies at $E_p = 0.598$, 1.092, 1.324

56D33 G.Dearnaley, Phil. Mag. 1, 821 (1956); 45, 1213 (1954).

Ne $_{10}$ Relative isotopic abundances ms
No Ne^{18} (<0.05%)
No Ne^{19}, Ne^{23}, Ne^{24}, Ne^{25} (<0.01%)

56K38 L.Kerwin, D.E.McElcheran, Can. J. Phys. 34, 1497 (1956).

Levels $F^{19}(p,\alpha_1\gamma)$ $E_p = 0.8$ to 1.4

E_o	Level	J	GM π, pc α
0.843	13.671	2^+	$p,\alpha_1(\theta)$ measured for 14 values of E_p
1.126	13.940	2^+	
1.250	14.058	1^-	
1.356	14.158	2^+	

56I04 A.Isoya, K.Goto, T.Momota, J. Phys. Soc. Japan 11, 899 (1956).

$Ne^{19}_{10\ 9}$ τ 17.7^S 1 $F^{19}(p,n)$
18^S

57P12 J.R.Penning, F.H.Schmidt, Phys. Rev. 105, 647 (1957).

τ 18.3^S 5 $F^{19}(p,n)$
β^+ 2.23 5 F-K linear ($E_\beta > 0.7$) scin
$\beta^+\nu(\theta) \propto 1 - (0.15\ 20)(v/c)\cos\theta$
suggests β interaction as ST(P)

57A29 W.P.Alford, D.R.Hamilton, Phys. Rev. 105, 673 (1957).

Levels $F^{19}(p,\alpha+6.13\gamma)$ scin $\alpha\gamma(\theta)$

E_o	Level	$\theta_p^2(3)/\theta_p^2(1)$*	$\theta_\alpha^2(4)/\theta_\alpha^2(2)$*
(0.873)	(13.70)	(1.2)	10.9 25
(1.372)	(14.17)	0.36	8.5 13

*Ratios of reduced widths for various orbital angular momenta shown in parentheses.
$R = 1.40(A_1^{1/3} + A_2^{1/3}) \times 10^{-13}$ cm was used.
$\alpha\gamma(\theta)$ also measured at 0.935, 1.250, 1.280, 1.346 resonances.

57M15 H.J.Martin, W.A.Fowler, C.C.Lauritsen, T.Lauritsen, Phys. Rev. 106, 1260 (1957).

$\beta^+\nu(\theta) \propto 1 + (0.14\ 13)(v/c)\cos\theta$
suggests β interaction as ST(P)

57G29 M.L.Good, E.J.Lauer, Phys. Rev. 105, 213 (1957).

Levels $F^{19}(p,\alpha_o)$ $E_p = 0.8$ to 2.7 VdG

J	E_o	Level	σ(mb)	Γ(kev)	pc t*	pc $p,\alpha_o(\theta)$ **
2^+	1.358 10	14.160	46 5	54 10	2.7	2.0
0^+	1.709 10	14.494	55 6	148 5	0	4.2
1^-	1.853 10	14.630	77 8	132 5	0.4	1.9
4^+?	2.11 2	14.88	10 2	75 25		0.52?
2^+?	2.31 2	15.06	32 5	80 25		3.6?
0^+?	2.58 2	15.32	51 10	300 25		119?

*(channel spin 1)/(channel spin 0)
**$\Gamma_p\Gamma_\alpha/\Gamma$ in kev

57C42 R.L.Clarke, E.B.Paul, Can. J. Phys. 35, 155 (1957).

$Ne^{19}_{10\ 9}$ Reaction γ's $F^{19}(p,n\gamma)$ $E_p = 4.8$; scin $n\gamma$

0.242 5	$n\gamma$ delay = 18^{+5}_{-3} μs 2
0.281 8	$n\gamma$ delay < 5 μs

57B09 R.Barloutaud, P.Lehmann, A.Lévêque, G.C.Phillips, J.Quidort, Compt. rend. 245, 422 (1957).

$Ne^{20}_{10\ 10}$ Levels $Na^{23}(p,\alpha)$ $E_p = 7.04, 7.17, 7.45$

100†	g.s. Q = +2.370 8	s 45° to 130°
309†	1.635 6	
309†	4.248 6	
	4.969 6	
	5.631 6	

†Relative intensities at $E_p = 7.04$, $\theta = 130°$

57B136 W.W.Buechner, A.Sperduto, Phys. Rev. 106, 1008 (1957).

Reaction γ $O^{(16)}(\alpha,\gamma_1)$ $E_\alpha = 3.05$
7.18 level $\Gamma_{\gamma 1} \leq 6$ mev scin 90°
T-forbidden 5.55γ not observed

57T23 B.J.Toppel, S.D.Bloom, D.H.Wilkinson, Phil. Mag. 2, 61 (1957).

Ne^{21} 10 11

Ground state

J 3/2 M

56H70 J.C.Hubbs, G.M.Grosof, Phys. Rev. 104, 715 (1956).

Levels $Ne^{(20)}(n,n)$ E_n = 1.9 to 3.5

E_o	Level	Γ(kev)	J	
1.94	**8.60**	20 *10*	$3/2^+$	4π pc
2.00	**8.66**	50 *10*	$3/2^-$	Ne recoil
2.11	**8.76**		$3/2^+$, $3/2^-$	

Additional resonances at E_n = 2.45?, 2.57, 2.73, 2.88, 3.28, 3.37?

57S55 C.P.Sikkema, Nuclear Phys. 3, 375 (1957).

Ne^{22} 10 12

Levels $Na^{23}(\gamma,p)$ E_γ = 17.6 scin

σ(mb)	Level	σ(mb)	Level
~0.3	**g.s.**	2	**4.4**
2.0	**1.3***		**5.4**
0.7	**3.3**		**5.7**

*Also observed with E_γ = 14.8

57M05 A.K.Mann, T.R.Ophel, I.F.Wright, Bull. Am. Phys. Soc. 2, No. 4, 181 E6 (1957); verbal report.

Resonance $F^{19}(t,\alpha)$ E_t = 1.1 to 2.1
peaks Excitation = 19.3 to 20.3 scin
Maxima for O^{18} g.s. α's found at E_t = 1.4, 1.9
Maximum for α's to O^{18} 1.99 level found at 1.8

Ne^{23} 10 13 38^S

τ **37.6^S** *1* $Na^{23}(d,2p)$ gas flow

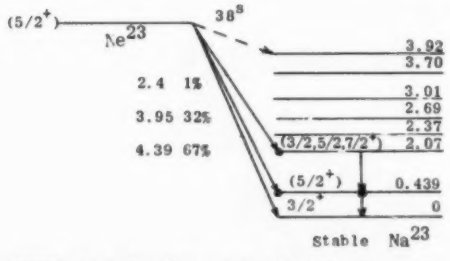
β^- 1.00 *15*%	**2.4** *1*		scin β (> 0.55 γ)
32 *3* %	**3.95** *5*		scin β(0.436 γ)
67 *3* %	**4.39** *5*		scin β

γ(Na^{23})

1000 †	**0.436** *4*	scin γ
30 *3* †	**1.647** *16*	scin γ

(1.647 γ)(0.436γ)

High energy γ's seen which are not definitely assigned to Ne^{23}: 2.06(83†), 2.20(46†), 2.42 (10†), 2.54(22†), 2.87(19†), 2.99(37†)



57P12 J.R.Penning, F.H.Schmidt, Phys. Rev. 105, 647 (1957).

Na^{22} 11 11 2.6^y

τ **2.58^y** *3*

57N47 W.F.Merritt, P.J.Campion, R.C.Hawkings, Can. J. Phys. 35, 16 (1957).

β^+ longitudinal polarization ($J = 3^+$ to 2^+)
$\geq +0.3$ $\langle E_\beta \rangle = 0.47$ ($\langle v/c \rangle = 0.75$)
More spins parallel to direction of motion
Measured difference of triplet and singlet positronium yields in gas under magnetic field $\gamma^+\gamma^+(\theta), \theta \sim 180°$

57P06 L.A.Page, M.Heinberg, Phys. Rev. 106, 1220 (1957).

β(right circular γ)(θ) = 1 + (0.39 *8*)$\langle v/c \rangle \cos\theta$
γ ray shown to be circularly polarized

57S21 H.Schopper, Phil. Mag. 2, 710 (1957).

Na^{22} 11 11

Levels $F^{19}(\alpha,n)$ E_α = 2.0 to 3.9
g.s. Q = **−1.950** *15*
$F^{19}(\alpha,n\gamma)$
0.602 J = 0*

*α, γ(θ) isotropic at 2 resonances

57W25 R.M.Williamson, B.S.Burton, Bull. Am. Phys. Soc. 2, No. 4, 182 E15 (1957).

Na^{23} 11 12

Levels $Na^{23}(p,p')$ E_p = 7.04, 7.17, 7.45 s 45° to 130°

100†	**g.s.**		
81†	**0.440** *3*		
36†	**2.078** *4*	13†	**3.678** *7*
13†	**2.393** *7*	5†	**3.850** *8*
12†	**2.641** *7*	8†	**3.915** *10*
17†	**2.705** *7*	3†	**4.431** *10*
15†	**2.983** *7*		**4.778** *10*

†Relative intensities at E_p = 7.04, θ = 130°

57B136 W.W.Buechner, A.Sperduto, Phys. Rev. 106, 1008 (1957).

Level $Na^{23}(\alpha,\alpha'\gamma)$ E_α = 1.5 to 3.7
0.446 *4* εB(E2) = 0.016 scin γ
J = 5/2 α, γ(θ)
(α yield)/(p yield) shows excitation is E2

$Na^{23}(p,p'\gamma)$ E_p = 0.90 to 0.98
Nonresonant yield of 0.446γ is just the amount expected from E2 Coulomb excitation

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967, 989 (1956); 98, 1198A (1955); 96, 426; 95, 629A (1954).

Level $Na^{23}(p,p'\gamma)$ E_p = 1.29, 1.46
(0.440) J > 1/2
J from anisotropy of p, γ(θ), $5/2^+$ most plausible

56R46 W.G.Read, R.W.Krone, Phys. Rev. 104, 1018 (1956); Bull. Am. Phys. Soc. 1, No. 4, 212 SA11 (1956).

$Na^{23}_{11\ 12}$

Reaction γ $Na^{23}(p,p'\gamma)$ $E_p = 1.29, 1.46$

(0.440) $\alpha_K = 4.9 \times 10^{-5}$ *6*

E2/M1 ≤ 0.05 sl ce,pe

J(0.440 level) > 1/2 from anisotropy of $p,\gamma(\theta)$, $5/2^+$ most plausible

56B121 R. Berenbaum, J.H. Towle, J.H. Matthews, Proc. Phys. Soc. 69A, 258 (1956).

Reaction γ $Na^{23}(N^{14},N^{14'}\gamma)$ $E_{N14} = 15.6$

0.435 *8* scin

56A36 D.G. Alkhazov, D.S. Andreyev, A.P. Greenberg, I.H. Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret Fiz. 30, 809 (1956).

$Na^{24}_{11\ 13}$ $^{15^h}$ g.s.

τ **15.10^h** *15* $Na^{23}(n,\gamma)$

Decay followed for 6.4 half-lives ic γ

57W37 H.W. Wright, E.I. Wyatt, S.A. Reynolds, W.S. Lyon, T.H. Handley, Nuclear Sci. Eng. 2, 427 (1957).

τ **15.01^h** *6* V(170-Mev p) chem

56R45 G. Rudstam, Thesis, Univ. Uppsala 1956.

τ **14.90^h** *5* differential ic

55T07 J. Tobailem, J. phys. radium 16, 48 (1955); Ann. phys. 10, 783 (1955).

Na^{23}(pile n,γ)

β^- **1.394** *4* F-K linear* sl

*F-K linear within 0.5% for $E_\beta = 0.11$ to 1.30

F.T. Porter, F. Wagner, Jr., M.S. Freedman, Phys. Rev. 107, 135 (1957); Bull. Am. Phys. Soc. 2, No. 4, 229 V1 (1957).

(2.75γ)(1.37γ)(L) $J = 4^+, 2^+, 0^+$ scin

56E16 I.V. Estulin, V.S. Popov, P.E. Chukreev, Zhur. Eksptl.' i Teoret. Fiz. 30, 1052 (1956); Soviet Phys. JETP 3, 866 (1956).

$Na^{24}_{11\ 13}$ Levels $Na^{23}(n,p)$ $E_n = 3.3$ to 6.0

11.93

12.33

$^{40^s}Ne^{23}$

57B143 N.A. Bostrom, R.G. Moore, I.L. Morgan, Bull. Am. Phys. Soc. 2, No. 2, 104 J7 (1957).

Capture γ's Na^{23}(th n,γ)

~0.090 scin

50	*10*†	**0.473** *4*			sl pe,Cp
30	*10*†	**0.877** *5*	8†	**2.210** *15*	
10	†	**1.630** *8*	~15†	**2.510** *15*	
~3	†	**1.900** *20*	7†	**3.070** *20*	
13	†	**2.030** *10*	18†	**3.590** *25*	

†Photons/100 Na captures

Continued

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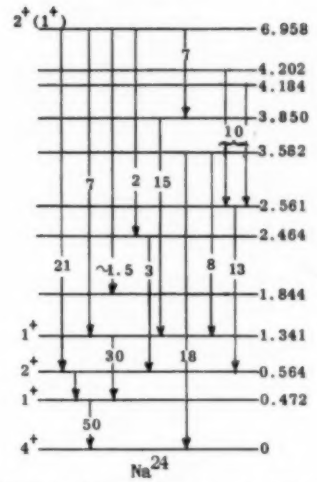
$Na^{24}_{11\ 13}$

Continued



Numbers in decay lines are γ's/100 capture
4 highest energy γ's from work of others

56M92 H.T. Motz, Phys. Rev. 104, 1353 (1956); 90, 355A (1953).

Resonance Na^{23}(n)

0.0029 J = 1

56L41 J.E. Lynn, quoted by V.L. Sailor, Phys. Rev. 104, 736 (1956).

Resonance Na^{23}(n) Li(p,n)

(Excitation = 7.01 Mev)

E_o(kev)	J (from σ)	Γ(kev)	l_n
53	3^-	0.8	1

57M46 E. Merzbacher, H.W. Newson, P.W. Crutchfield, W. Haberli, Bull. Am. Phys. Soc. 2, No. 1, 33 K8, K9 (1957); verbal report.

$Na^{25}_{11\ 14}$ $^{60^s}$

$\gamma(Mg^{25})$ $Mg^{(25)}$(14-Mev n,p)

	(0.40)	124†	**(0.98)**	scin
111†	**(0.58)**	41†	**(1.61)**	

No 1.96γ (<3†)

56G57 H.E. Gove, G.A. Bartholomew, E.B. Paul, A.E. Litherland, Nuclear Phys. 2, 132 (1956); Bull. Am. Phys. Soc. 1, No. 1, 29 GA8 (1956).

$_{12}$Mg Levels $Mg(p,p')$ $E_p = 9.62$; a

Isotopic Assignment	Level	Graph given for $p,p(\theta)$
Mg^{25}	**0.55** *5*	
Mg^{25}	**0.98** *5*	
Mg^{24}	**1.37** *5*	$p,p'(\theta)$*
Mg^{24}	**4.22** *5*	$p,p'(\theta)$
Mg^{25}, Mg^{26}	**4.77** *5*	
Mg^{24}	**5.24** *5*	$p,p'(\theta)$
Mg^{25}, Mg^{26}	**6.00** *5*	
Mg^{25}	**6.42** *5*	
Mg^{25}	**6.90** *5*	*also for $E_p = 8.86$

56G53 G.W. Greenlees, A.E. Souch, Proc. Phys. Soc. 69A, 686 (1956).

$Mg^{24}_{12\ 12}$ Levels $Al^{27}(p,\alpha)$ $E_p = 4.655$
g.s. $Q = +1.596$ *6* sd 91°
1.366 *6*

57V03 D.M.Van Patter, W.C.Porter, M.A. Rothman, Phys. Rev. 106, 1016 (1957); Bull. Am. Phys. Soc. 2, No. 3, 143 R5 (1957).

Level $Mg^{(24)}(e,e')$ $E_e = 187$
(1.37) $\tau \sim 1.3^{\mu\mu s}$ s 40° to 100°
From analysis of $\sigma(e,e')$

56H83 R.H.Helm, Phys. Rev. 104, 1466 (1956).

Levels $Na^{23}(d,n)$ $E_d = 7.75$ ppl d,n(θ)

Level	l_p
(4.13) }	0,2
(4.24) }	
7.45 *10*	0
8.48 *10*	0,2
9.85?*20*	
10.46 *10*	0

No n group to g.s.

57E13 F.A. El Bedewi, M.A. El Wahab, Nuclear Phys. 3, 385 (1957).

Levels $Na^{23}(p,p)$ $E_p = 0.58$ to 1.50
$Na^{23}(p,\alpha)$ scin p 4 angles;
$Na^{23}(p,\gamma)$ α 157.5°; p,$\gamma(\theta)$

E_o	Level	Γ(kev)	Γ_p/Γ	J
0.594	12.273	2 *1*	0.9 *1*	3^-
0.725	12.393	7 *2*	>0.9	0^-
0.797	12.467		0.8 *1*	1^-
0.815	12.484		0.6 *2*	2^+
0.849	12.517		>0.6	4^+
0.877	12.543	8 *2*	≥0.9	1^+
0.922	12.587		0.6	2^+
0.989	12.651	<1		4^-
1.022	12.682		0.9	2^-
1.166	12.820			2^+?
1.176	12.830		0.7 *2*	1^+
1.206	12.859			2^-?
1.213	12.865		0.7 *2*	3^+?
1.258	12.909		0.5 *2*	1^+
1.288	12.937		>0.9	1^-
1.321	12.969			3^+
1.365	13.012			0^-?
1.398	13.044		0.7 *1*	3^+
1.419	13.064			4^+
1.460	13.103		0.9 *1*	3^-

Additional 16 resonances observed

56P36 F.W.Prosser, Jr., N.P.Baumann, D.K. Brice, W.G.Read, R.W.Krone, Phys. Rev. 104, 369 (1956); 104, 376 (1956).

Levels $Na^{23}(p,p)$ $E_p = 0.4$ to 1.0
s 3 angles

E_o	Level	l_p
0.860	12.527	0
0.92	12.58	1 or 2

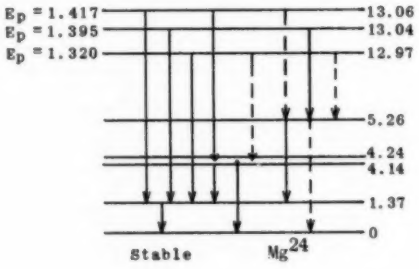
56D33 G.Dearnaley, Phil. Mag. 1, 821 (1956).

$Mg^{24}_{12\ 12}$ Resonance peaks $Na^{23}(p,\gamma)$ $E_p = 0.95$ to 1.45
$Na^{23}(p,p' + 0.44\gamma)$
$Na^{23}(p,\alpha + 1.63\gamma)$
(Excitation ~12.9 Mev)

E_o	γ detected	
1.091	0.44, $E_\gamma > 2$	scin
1.097	0.44, 1.63	
1.320	capture γ's	
1.330	1.63, $E_\gamma > 2$	
1.336*	0.44	
1.356	$E_\gamma > 2$	
1.395	capture γ's	
1.417	capture γ's	

*May be 2 unresolved peaks

Capture γ's $Na^{23}(p,\gamma)$ scin



56T32 J.W.Teener, L.A.Beach, NRL-4821 (1956).

$Mg^{25}_{12\ 13}$ Levels $Mg^{(24)}(d,p\gamma)$ $E_d = 2$ to 4
scin d,p(θ)

Level	l_n	J	
g.s.	2		
(0.58)	0		
(1.96)	2		
(3.40)	1	$3/2^-$	p$\gamma(\theta)$

57C54 S.A.Cox, R.M.Williamson, Phys. Rev. 105, 1799 (1957); 99, 644A (1955); Bull. Am. Phys. Soc. 1, No. 1, 196 N4 (1956).

Levels $Mg^{(24)}(d,p)$ $E_d = 4.04$
g.s. $Q = +5.022$ s ~110°

0.503*	2.695*	4.857*	6.087
0.998*	2.871*?	4.960	6.249
1.581*?	3.924*	5.147	6.542
2.022*	4.030*	5.341	6.948*
2.471*?	4.622	5.536*	7.074

Errors are 0.040 to 0.050
*Isotopic assignment due to other workers. Other levels assigned from intensities.

55K35 L.M.Khromchenko, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 277 (1955); Columbia Tech. Transl. p.252; Doklady Akad. Nauk SSSR 93, 451 (1954).

Reaction γ's $Mg^{(24)}(d,p\gamma)$ $E_d = 1.2$
(a p)(scin γ)

0.37 *3*	1.64 *3*
0.60 *3*	1.95
1.01 *3*	2.93
1.35	

57G32 S.Gorodetzky, M.Port, T.Muller, G.Bergdolt, Compt. rend. 244, 2041 (1957).

$Mg^{25}_{12\ 13}$

Reaction γ's $Mg^{25}(p,p'\gamma)$ E_p = 1.7 to 3.0 scin 0° to 90°

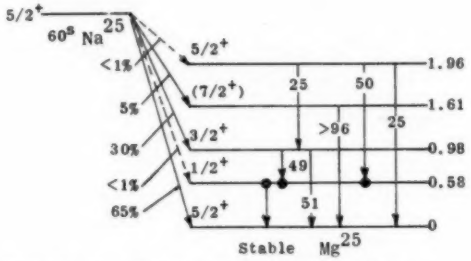
0.98 level		
100†	(0.40)	
	(0.58) 105 3†	(0.98)
1.61 level		
>96%	(1.61)	

No 0.63γ (<3%) No 1.03γ (<1%)

1.96 level		
	(0.40) 50 10†	(0.98)*
	(0.58) 100 †	(1.38)
	(0.98) 49 2†	(1.96)

(0.58γ)(0.40, 0.98, 1.38γ)

*Starts from 1.96 level



Numbers in γ lines are branching ratios determined from study of $Mg^{25}(p,p'\gamma)$

β intensities deduced from γ and assumed g.s. β intensities

56G57 H.E.Gove, G.A.Bartholomew, E.B.Paul, A.E.Litherland, Nuclear Phys. 2, 132(1956); 3,344 (1957).

$Mg^{27}_{12\ 15}$

Levels $Al^{27}(n,p)$ E_n = 14

σ(mb)	Level	σ(mb)	Level	ppl 15° to 165°
0.3	g.s.	7.3	(3.5)	
0.9	(1.0)	9.7*	5.7	
1.8	1.6	16.2*	7.0?	

All proton groups are approximately isotropic

*May partly be due to (n,d) reaction

57H11 R.K.Haling, R.A.Peck, Jr., H.P.Eubank, Phys. Rev. 106, 971 (1957); Bull. Am. Phys. Soc. 1, No. 1, 29, GA9 (1956).

$Al^{25}_{13\ 12}$ 7.6s

$Mg^{(24)}$(0.22-Mev p,γ)

No disintegration γ

56C41 D.R.Chick, W.W.Evans, D.A.Hancock, S.E.Hunt, R.A.Pope, Proc. Phys. Soc. 69A, 624 (1956).
56V16 J.Varma, Proc. Phys. Soc. 69A, 641 (1956).

$Al^{25}_{13\ 12}$

Capture γ's $Mg^{(24)}(p,\gamma)$ E_p = 0.222 p,$\gamma(\theta)$ scin

2.51 level	$J = 1/2^+$	
~100†	0.453 5	
10†	0.94	100† 2.06
14†	1.57	3† 2.51

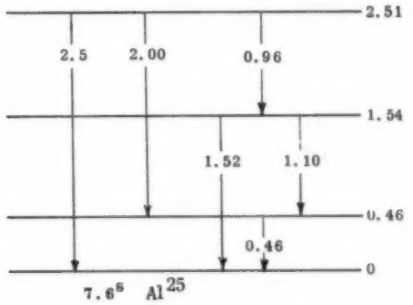
(2.06γ)(0.453γ)(θ) $\eta(\pi)$ = 0.00 6

56V16 J.Varma, Proc. Phys. Soc. 69A, 641 (1956).

$Al^{25}_{13\ 12}$

Capture γ's $Mg^{(24)}(p,\gamma)$ E_p = 0.2255 scin

2.51 level			
st	0.46 2		1.52 4
	0.96 4	st	2.00 4
	1.10 3	w	2.5



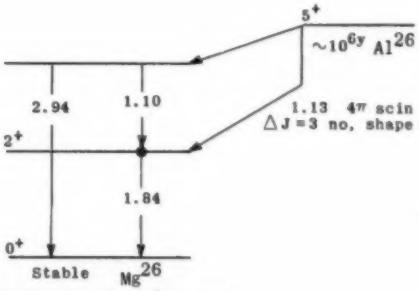
56C41 D.R.Chick, W.W.Evans, D.A.Hancock, S.E.Hunt, R.A.Pope, Proc. Phys. Soc. 69A, 624 (1956).

Capture γ's $Mg^{(24)}(p,\gamma)$ E_p = 0.421 scin p,$\gamma(\theta)$

2.70 level		$J = 3/2^+$
22†	0.9	(2 unresolved γ's)
5†	1.36	E2/M1
4†	1.81	0.06
15†	2.26	0.014 or 2.54
10†	2.71	0.39 or 8.0

56V24 J.Varma, W.Jack, Physica 22, 1139A (1956).

$Al^{26}_{13\ 13}$ $\sim 10^{6}$y g.s.



No 0.72 γ No β^+(1.10γ)

57J17 R.G.Johnson, R.D.Moffat, Bull. Am. Phys.Soc. 2, No. 4, 230 V2 (1957); verbal report.

$Al^{27}_{13\ 14}$

Levels $Al^{27}(n,n')$ E_n = 4.4 ppl 82°

σ(mb/sr)	Level
46 10	g.s.
19 7	(0.84) / (1.01)
15 5	(2.23)
15 5	(3.0)

No neutron group to 2.73 level (σ<3mb/sr)

56W36 J.B.Weddell, Phys. Rev. 104, 1069 (1956).

$Al^{27}_{13\ 14}$

Levels $Al^{27}(p,p')$ $E_p = 4.655$

0.842 3	2.727 4	sd 91°
1.013 3	2.975 4	
2.205 4	2.998 4	

57V03 D.M.Van Patter, W.C.Porter, M.A. Rothman, Phys. Rev. 106, 1016 (1957); Bull. Am. Phys. Soc. 2, No. 3, 143 R5 (1957).

Levels $Mg^{24}(\alpha,p)$ $E_\alpha = 8.4$

0.85 4	2.17 4	a pc
1.06 4	2.64 10	90°

57G47 H.G.Graetzer, A.B.Robbins, Phys. Rev. 105, 1570 (1957); Bull. Am. Phys. Soc. 1, No. 6, 280 B2 (1956).

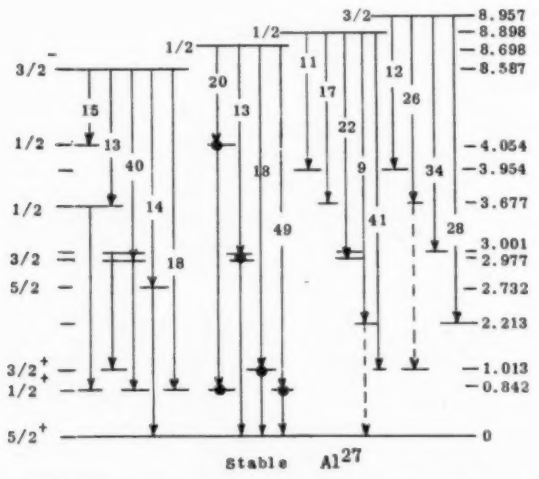
$Al^{28}_{13\ 15}$

Levels $Mg^{26}(p,\gamma)$ $E_p \leq 0.8$ [scin $\gamma,\gamma\gamma$; $p,\gamma(\theta)$]

Level	J	
(0.842)	$1/2^+$	
(1.013)		
(2.213)	$3/2^*$	
(2.732)	5/2	
(2.977)	3/2?	unresolved$^\$$
(3.001)	3/2?	unresolved$^\$$
(3.677)	1/2	
(3.954)	1/2,5/2*	
(4.054)	1/2	$\Gamma_p\Gamma_\gamma/(\Gamma_p+\Gamma_\gamma)$ 0.4 1 ev
(8.587)	$3/2^-$	1.4 3
(8.698)	1/2	0.7 2
(8.898)	1/2	0.21 5
(8.957)	3/2	

*Assumed pure dipole γ from 8.957 level

$^\$J = 3/2$ for at least one level



Numbers in decay lines are branching ratios of γ's

56V22 C. van der Leun, P.M.Endt, J.C.Kluyver, L.E.Vrenken, Physica 22, 1223 (1956).

$Al^{27}_{13\ 14}$

Reaction γ's $Al^{27}(p,p'\gamma)$ $E_p = 1.4$ to 2.8 [scin $\gamma,\gamma\gamma$; $p\gamma(\theta)$]

0.84 level J = 1/2

(0.84)

1.01 level J = 3/2

2.3 3† 0.170 7

(0.84)

98 † (1.01)

(0.170 γ)(0.84γ)

57A31 E.Almqvist, D.A.Bromley, H.E.Gove, A.E.Litherland, Bull. Am. Phys. Soc. 2, No. 4, 178 D7 (1957).

$Al^{27}(n,p;\ n,pn)$ $E_n = 13.2$; ppl

Preferred emission of protons in forward direction for all E_p noted

Graphs of $\sigma(E_p)$ and $\sigma(\theta)$ given

57B127 G.Brown, G.C.Morrison, H.Muirhead, W.T.Morton, Phil. Mag. 2, 785 (1957).

Levels $Mg^{25}(\alpha,p)$ $E_\alpha = 8.4$

g.s. } Q = −1.29 4 a pc 90°
(0.031) }

57G47 H.G.Graetzer, A.B.Robbins, Phys. Rev. 105, 1570 (1957); Bull. Am. Phys. Soc. 1, No. 6, 280 B2 (1956).

Levels $Al^{27}(d,p)$ $E_d = 3.05,\ 4.31$

g.s.	Q = +5.475		
0.980	3.747?	5.396	
1.597	3.934	5.643	6.641
2.152	4.277	5.784	6.855
2.574	4.469	5.968	7.013
2.929	4.720	6.148	7.197
3.334	4.883?	6.298	7.599?
3.520	5.170	6.438	7.896?

Errors are 0.020 to 0.030

55K35 L.M.Khromchenko, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 277 (1955); Columbia Tech. Transl. p.252; Doklady Akad. Nauk SSSR 94, 1037 (1954).

Level $Al^{27}(d,p)$ $E_d = 1.2$ recoil

(0.031) $\tau = 2.1^{m\mu s}$ 3

56S108 J.C.Severiens, S.S.Hanna, Phys. Rev. 104, 1612 (1956); 100, 1254A (1955).

Levels $Al^{27}(d,p)$ $E_d = 1.1$ to 5.6 s 109°

Level	l_n*	
(0.97) }	2	for at least one level
(1.01) }		
(1.37)	0?	
(1.62)	2	
(5.13)	3	
(5.43)	1	
8.24		

*From excitation curve relative to g.s. group

56N22 I.A.Nemilov, V.F.Litvin, Zhur. Eksptl', i Teoret. Fiz. 30, 686 (1956); Soviet Phys. JETP 3, 523 (1956).

$Al^{28}_{13\ 15}$ Resonances $Al^{27}(n)$ (Excitation ~7.7 Mev) Li(p,n)

E_o(kev)	J (from σ)	Γ(kev)
36	2^+	3
88	3	12

57M46 E.Merzbacher, H.W.Newson, P.W. Crutchfield, W.Haberli, Bull. Am. Phys. Soc. 2, No. 1, 33 K8, K9 (1957); verbal report.

$Al^{29}_{13\ 16}$ Levels $Mg^{26}(\alpha,p)$ E_α = 8.4

g.s. Q= −2.90 *4* a pc 90°

1.69 *10*

No level between g.s. and 1.69 level (< 20% of g.s. group)

57G47 H.G.Graetzer, A.B.Robbins, Phys. Rev. 105, 1570 (1957); Bull. Am. Phys. Soc. 1, No. 6, 280 B2 (1956).

Si$_{14}$ Capture γ's Si(th n,γ) sπ Cp

16†	1.280* *10*	37.4†	4.930* *10*
~3†	~1.5*	2.3†	5.118* *15*
~3†	~1.7*	0.8†	5.242 *30*
3.4†	1.95 *2*	1†	6.041* *50*
12.8†	2.100* *10*	9.2†	6.354* *15*
36.5†	3.547* *10*	1.4†	6.758$ *20*
3.2†	3.667* *20*	6.1†	7.224* *30*
~3†	~3.8$	0.5†	7.38? *3*
4.2†	3.976* *20*	1.6†	8.482* *15*
2†	4.30? *5*	0.2†	10.59$ *3*

No 2.69γ

Study covered E_γ = 0.25 to 11

†Photons/100 Si captures (σ_a = 0.091)
(Max in Si^{29}, Si^{30}, Si^{31} = 82†, 14†, 4†)
*Assigned to Si^{29}. 5.118γ may also be in Si^{30}
$Assigned to Si^{30}
Unresolved γ's with E_γ < 3.5 present

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

$Si^{28}_{14\ 14}$ Levels $P^{31}(p,\alpha)$ E_p = 6.5, 7.0

g.s. Q= +1.909 *10* s 50°, 90°, 130°

1.771 *8*

4.617 *8*

57E23 P.M.Endt, C.H.Paris, Phys. Rev. 106, 764 (1957).

Levels $Al^{27}(d,n)$ E_d = 2.16, 6.0; ppl d,n(θ) 0° to 135°

	l_p	
g.s.	2	
(1.78)		
4.62	1	unresolved
4.9		
6.24	0	
6.88	1	

Continued

$Si^{28}_{14\ 14}$ Continued

7.39	l_p	nearly isotropic
7.90	0	
8.28	1?	
8.57	0	
9.39	0?	

57R61 A.G.Rubin, Bull. Am. Phys. Soc. 2, No. 4, 233 X9 (1957); verbal report.

Level $Si^{(28)}(e,e')$ E_e = 187 s 40° to 110°

1.78 $\tau \sim 0.42^{\mu\mu s}$

From analysis of $\sigma(e,e')$

56H83 R.H.Helm, Phys. Rev. 104, 1466 (1956).

Levels $Al^{27}(d,n)$ E_d = 2.17 ppl 0° to 120°

(1.78)			
4.54	*20*		
4.95	*20*	8.31	*10*
6.24	*6*	8.57	*8*
6.88	*6*	9.37	*4*
7.39	*6*	10.00	*10*
7.89	*6*	10.25	*6*

56R40 A.G.Rubin, F.Ajzenberg-Selove, H.Mark, Phys. Rev. 104, 727 (1956); 100, 961A (1955).

Level $Al^{27}(p,\gamma\gamma)$ scin $\gamma\gamma$
$Mg^{25}(\alpha,n\gamma)$ scin γ

Level	J	γ
(4.62)	≥3*	1.77, 2.85

4.62γ observed at 0.993 resonance in $Al^{27}(p,\gamma)$ does not accompany the above two γ's at other resonances or in $Mg^{25}(\alpha,n\gamma)$ reaction
*From no 4.62γ and J ≠ 0 from (1.77γ)(2.85γ)(θ)

57G31 H.E.Gove, A.E.Litherland, E.B.Paul, Bull. Am. Phys. Soc. 2, No. 4, 178 D6 (1957); verbal report.

Capture γ's $Al^{27}(p,\gamma)$ (Excitation = 12.08 Mev)

0.5045 ? resonance		Γ≤0.75 kev	
25†	10.3 *1*		scin
100†	12.0 *1*		
0.5065 ? resonance		Γ≤0.38 kev	
	5.2 *1*		
	7.5 *1*		
100†	10.3 *1*		
25†	12.0 *1*		

57A57 S.L.Andersen, T.Holtebekk, O.Lönsjö, R.Tangen, Nuclear Phys. 4, 39 (1957).

Resonance $Al^{27}(p,\gamma)$

0.9908 Γ = 50 *30* ev

E_p changed by varying target potential (±500ev)

56B105 F.Bumiller, J.Müller, H.H.Staub, Helv. Phys. Acta 29, 234 (1956).

Si^{28} 14 14

Resonance $Al^{27}(p,\gamma)$ $E_p = 0.98$ to 1.01
(Excitation = 12.55)
0.9957 *30* scin

57B118 D.A.Bromley, E.Almqvist, H.E.Gove, A.E.Litherland, E.B.Paul, A.J.Ferguson, Phys. Rev. 105, 957 (1957).

Si^{29} 14 15

Levels $Si^{(28)}(d,p)$ $E_d = 4.44$
g.s. $Q = +6.229$ *40* s ~110°

1.237*			
2.038*	4.223*	6.453*	7.820
2.416*	4.931*	6.728	8.354
3.083*	5.944*	7.000	8.832
3.662*	6.138*	7.577	9.112?

Errors are 0.040 to 0.050
*Isotopic assignment due to other workers.
Other levels assigned from intensities.

55K35 L.M.Khromchenko, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 277 (1955); Columbia Tech. Transl. p.252; Doklady Akad. Nauk SSSR 98, 761 (1954).

Capture γ's $Si^{(28)}(th\ n,\gamma)$ sm Cp

16†	1.280 *10*		
~3†	~1.5	37.4†	4.930 *10*
~3†	~1.7	2.3†	5.118* *15*
12.8†	2.100 *10*	1†	6.041 *50*
36.5†	3.547 *10*	9.2†	6.354 *15*
3.2†	3.667 *20*	6.1†	7.224 *30*
4.2†	3.976 *20*	1.6†	8.482 *15*

No 2.69 γ Study covered $E_\gamma = 0.25$ to 11
†Photons/100 Si captures ($\sigma_a = 0.091$)
(Max in Si^{29}, Si^{30}, Si^{31} = 82†, 14†, 4†)
Isotopic assignments from intensities and energetics *May also be in Si^{30}

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

Si^{30} 14 16

Capture γ's $Si^{(29)}(th\ n,\gamma)$ sm Cp

~3†	~3.8	
2.3†	5.118* *15*	
1.4†	6.758 *20*	
0.2†	10.59 *3*	

†Photons/100 Si captures ($\sigma_a = 0.091$)
(Max in Si^{29}, Si^{30}, Si^{31} = 82†, 14†, 4†)
Isotopic assignments from intensities and energetics
*May also be in Si^{29}

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

Si^{32} 14 18 ~700^y

$Si^{(30)}$(pile n) chem
$\tau \geq 600^y \times \sigma_{barns}[Si^{31}(n,\gamma)]$
No $14^d P^{32}$ activity found

57R48 L.P.Roy, L.Yaffe, Can. J. Chem. 35, 176 (1957).

P 15

Resonance peaks $Si(p,\gamma)$ $E_p = 1.0$ to 2.6 GM

1.520	
1.618	1.849
1.635	1.879
1.647	2.520
1.663	2.543
1.680	2.553
1.699	2.5575
1.774	2.570
1.810	2.575

See P^{30} and P^{31} for resonances from $E_p = 0.5$ to 1.0

56T30 S.P.Tsytko, I.P.Antuf'ev, Zhur. Eksptl.' i Teoret. Fiz. 30, 1171 (1956); Soviet Phys. JETP 3, 993 (1956).

P^{29} 15 14

Levels $Si^{(28)}(d,n)$ $E_d = 9.0$ scin d,n(θ)

	Level	l_p	θ^2	
28†	g.s.	0	0.025	Q = +0.6 *1*
7.5†	1.30	2	0.015	
7†	1.92	2	0.007*	
3$	(2.5)			
4$	(2.9)			
~9.5$	3.5			

†$\sigma(0°)$ in mb/sr $ $\sigma(15°$ c.m.) in mb/sr
*If J = 5/2

56C02 J.M.Calvert, A.A.Jaffe, E.E.Maslin, Proc. Phys. Soc. 70A, 78 (1957).

Levels $Si^{(28)}(p,p)$ $E_p = 1.4$ to 3.8

E_a	Level	Γ(kev)	J	EA
1.66	4.33	60	$3/2^-$	53°, 88°, 140°, 167°
2.09	4.74	25	$1/2^+$	
2.88	5.50	600	$1/2^-$	
3.10	5.72	~12	$5/2^-$ (7/2?)	
3.34	5.95	~12	$3/2^+$ (5/2?)	

57V24 J.Vorona, J.W.Olness, W.Haeberli, H.W.Lewis, Bull. Am. Phys. Soc. 2, No. 1, 34 K11 (1957); verbal report.

$Si^{(28)}(p,\gamma)$ $E_p = 0.5$ to 1.0
No resonances observed

56T30 S.P.Tsytko, I.P.Antuf'ev, Zhur Eksptl.' i Teoret. Fiz. 30, 1171 (1956); Soviet Phys. JETP 3, 993 (1956).

P^{30} 15 15 2.5^m

$\gamma(Si^{30})$ $Al^{27}(\alpha,n)$
~0.5% **(2.24)** scin γ,
From P^{30} to K^{38} γ and β^+ ratios GM β^+

56M67 H.Morinaga, E.Bleuler, Phys. Rev. 103, 1423 (1956); 99, 658A (1955).

P^{30}
15 15

Levels $S^{(32)}(d,\alpha)$ $E_d = 6.55$

g.s.	Q=+4.887 *8*	[	s 90°,
0.683 *10*	T=1*	[	130°
0.709 *5*	T=0*	4.231 *8*	
1.452 *6*		4.298 *8*	
1.972 *7*		4.343 *8*	
2.539 *7*		4.421 *8*	
2.724 *7*		4.502 *8*	
2.839 *7*		4.624 *8*	
2.936 *7*		4.734 *8*	
3.018 *7*		4.928 *8*	
3.734 *8*		5.025?*10*	
3.837 *8*		5.202?*10*	
3.927 *8*		5.413?*10*	
4.142 *8*		5.599?*10*	
4.180 *8*		5.705?*10*	

*Intensity ratio of 0.683 group to 0.709 group is 10% at 90° and <3% at 130°

57P03 C.H.Paris, C.Van der Leun, P.M.Endt, Bull. Am. Phys. Soc. 2, No. 4, 179 D9 (1957); verbal report.

Levels $S^{32}(d,\alpha)$ $E_d = 1.6$ to 2.9

g.s.	Q = +4.831 *13*	
0.693	T = 0*	s 63°, 90°
1.440		
1.97		

*From yield comparable to that of g.s.

56L43 L.L.Lee, Jr., F.P.Mooring, Phys. Rev. 104, 1342 (1956); Bull. Am. Phys. Soc. 1, No. 6, 281 B8 (1956).

Levels $Si^{(29)}(p,\gamma)$ $E_p = 0.8$ to 1.0 GM

E_o	Level
0.9165 *5*	6.40
0.956 *1*	6.44

56T30 S.P.Tsytko, I.P.Antuf'ev, Zhur. Eksptl.' i Teoret. Fiz. 30, 1171 (1956); Soviet Phys. JETP 3, 993 (1956).

Levels $Si^{(28)}(d,p)$ $E_d = 1.75$ to 4.75 s 109°

E_o	Level
3.26	14.8
3.75	15.3
4.23	15.7

Levels from ratios of yields of $p_o, p_1, p_2 \cdots p_5$

57N05 I.A.Nemilov, V.F.Litvin, Zhur. Eksptl'. i Teoret. Fiz. 31, 719 (1955); Soviet Phys. JETP 4, 606 (1957).

P^{31}
15 16

Levels $P^{31}(p,p')$ $E_p = 4.66$ sd 91°

1.264 *4*
2.230 *5*
3.134 *6*
3.292 *5*

No level below 1.26 (yield < 2% of p_1)

57V04 D.M.Van Patter, M.A.Rothman, W.C. Porter, C.E.Mandeville, Phys. Rev. 107, 171 (1957); 103, 658 (1956); Physica 22, 1125A (1956).

P^{31}
15 16

Levels $P^{31}(p,p')$ $E_p = 6.5, 7.0$

1.267 *5*	s 50°, 90°, 130°
2.234 *5*	4.257 *5*
3.133 *5*	4.430 *5*
3.293 *5*	4.590 *5*
3.414 *5*	4.633 *5*
3.505 *5*	4.784 *5*
4.188 *5*	5.012 *5*

57E23 P.M.Endt, C.H.Paris, Phys. Rev. 106, 764 (1957).

Levels $Si^{(30)}(p,\gamma)$ $E_p = 0.5$ to 1.0 GM

E_o	Level	E_o	Level
0.6195	7.889		
0.717	7.983	0.831	8.093
0.753	8.018	0.895	8.155
0.775	8.039	0.940	8.199
0.880	8.063	0.980	8.237

Assignments from absence of β^+ activities

56T30 S.P.Tsytko, I.P.Antuf'ev, Zhur. Eksptl.' i Teoret. Fiz. 30, 1171 (1956); Soviet Phys. JETP 3, 993 (1956).

P^{32}
15 17
14^d

β^- 1.711 *2* P-K not linear* sl

*Shape factor decreases ~3% from $E_\beta = 0.27$ to 1.63.

57P36 F.T.Porter, F.Wagner, Jr., M.S.Freedman, Phys. Rev. 107, 135 (1957); Bull. Am. Phys. Soc. 2, No. 4, 229 V1 (1957).

$\overline{E}_\beta = 0.693$ *22* β calorimeter

$\overline{E}_\beta$(calculated) for 1.70 $\beta = 0.695$

57S50 N.S.Shimanskaia, Zhur. Eksptl'. i Teoret. Fiz. 31, 393 (1956); Soviet Phys. JETP 4, 355 (1957).

β^- longitudinal polarization ($J = 1^+$ to 0^+)

-0.50 *11* $E_\beta = 0.168$ ($v/c = 0.66$)

More spins antiparallel to direction of motion

Measured scattering of β's by gold foil after deflection by electric field

57D21 H. de Waard, O.J.Poppema, Physica 23, 597 (1957).

β^- longitudinal polarization ($J = 1^+$ to 0^+)

-0.85 *11*	$E_\beta = 0.3$ to 1.0 ($\langle v/c \rangle = 0.85$)
-0.94 *16*	$E_\beta = 0.8$ to 1.6 ($\langle v/c \rangle = 0.94$)

More spins antiparallel to direction of motion

Measured Møller scattering of β's by magnetized Deltamax foil scin ee

57F26 H.Frauenfelder, A.O.Hanson, N.Levine, A.Rossi, G.DePasquali, Phys. Rev. 107, 643 (1957).

P^{32} 15 17

Levels $P^{31}(d,p)$ $E_d = 4$ cyc ppl d,p(θ)

Level	l_n
g.s.	2
(0.077)	
(0.515)	0
(1.154)	0
(1.316)	3
(1.750)	d,p(θ) isotropic

56T34 I.B.Teplov, Zhur. Eksptl.' i Teoret. Fiz. 31, 25 (1956); Soviet Phys. JETP 4, 31 (1957).

Levels $P^{31}(d,p)$ $E_d = 8.9$; s d,p(θ)

	Level	l_n		Level	l_n
7†	g.s.	2	0.8†	(4.207)	0
	(0.077)		1†	4.43 *10*	1*
0.7†	(0.515)	0	5†	4.90 *7*	1*
1.2†	(1.154)	0		5.11 *10*	
0.6†	(2.177)	0 or 1	7†	5.37 *7*	1*
	(2.227)		2†	5.53 *7*	1*
8†	(3.259)	1*	8†	5.82 *7*	1*
	(3.318)		3†	6.09 *7*	1
	3.45 *10*		1†	6.34 *10*	1
9†	(4.032)	1*		6.56 *7*	1 or 2

†Relative $(2J+1)\theta^2$

*d,p(θ) below Butler curve at low energies

57D06 A.W.Dalton, S.Hinds, G.Parry, Proc. Phys. Soc. 70A, 586 (1957).

P^{34} 15 19 12^s

$S^{(34)}$(fast n,p) scin

$\gamma(S^{34})$ (2.10)
~0.2% 4.0
No 3.22γ (<0.4%)

56M67 H.Morinaga, E.Bleuler, Phys. Rev. 103, 1423 (1956); 99, 658A (1955).

S^{31} 16 15

Levels $P^{31}(p,n)$ $E_p = 17.2$ ppl, 5 angles

g.s.	Q = −6.06 *20*
1.15 *15*	
2.28 *20*	
3.35 *20*	
~3.6?	
4.51 *15*	(2 unresolved levels?)
5.94 *30*	
6.41 *20*	

56R50 A.G.Rubin, G.D.Johnson, J.B.Reynolds, Phys. Rev. 104, 1444 (1956); 98, 1185A (1955).

S^{32} 16 16

Levels $S^{(32)}(e,e')$ $E_e = 187$ s 35° to 110°

g.s.	
(2.23)	$\tau \sim 0.11^{\mu\mu s}$
	$J = 2^+$
(3.81)	$J = 2^+, 3^-$, or 4^+
(5.83)	
~6.6	(from impurity ?)

J from comparison with "universal" form factor curves

56H83 R.H.Helm, Phys. Rev. 104, 1466 (1956).

S^{32} 16 16

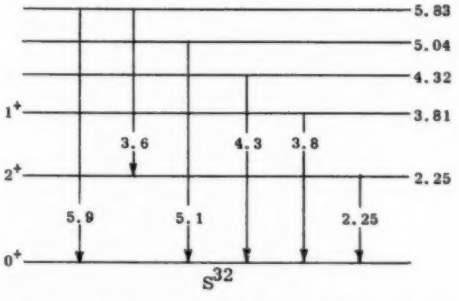
Level $Cl^{(35)}(p,\alpha)$ $E_p = 3.76$ sd 91°

g.s. Q = +1.860 *5*

57V03 D.M.Van Patter, W.C.Porter, M.A. Rothman, Phys. Rev. 106, 1016 (1957).

Levels $P^{31}(p,\gamma)$ $E_p = 0.4$ to 2.0 scin

Γ(kev)	Level	γ's
34	9.295	
	9.378	
17	9.481	
15	9.643	
9	9.720	
<5	9.857	
6	9.891	
	9.922	
5	9.944	2.25, 3.8, 4.3, 7.7
9	10.044	2.25, 3.8, 7.7
15	10.206	2.25, 5.1, 7.9, 10
12	10.238	2.25, 3.6, 5.9?
6	10.279	2.25, 8, 10
14	10.325	
7	10.366	2.25, 3.6?, 3.8, 4.3, 5.9, 8
5	10.391	2.25, 3.8, 8.1
	10.672	
	10.697	
	10.755	



56K30 B.D.Kern, L.W.Cochran, Phys. Rev. 104, 711 (1956); 99, 645A (1955).

S^{33} 16 17

Levels $S^{(32)}(d,p)$ Q = +6.413 *6* $E_d = 6.55$ s 90°, 130°

g.s.	
0.841 *5*	
1.964 *6*	4.097 *6*
2.312 *6*	4.146 *6*
2.868 *6*	4.213 *6*
2.936 *6*	4.378 *6*
2.972 *6*	4.427 *6*
3.222 *6*	4.733 *6*
3.832 *6*	4.748 *6*
3.935 *6*	4.869 *6*
4.050 *6*	4.919 *6*

48 additional levels from 4.942 to 7.185

57P03 C.H.Paris, C.Van der Leun, P.M.Endt, Bull. Am. Phys. Soc. 2, No. 4, 179 D9 (1957); verbal report.

$S^{33}_{16\ 17}$ Levels $S^{(32)}(d,p)$ $E_d = 3.8, 4.7$

g.s.	Q = +6.633 *20*	s
0.786	5.90	
1.869	6.102	
2.228	6.622	
2.956	6.916	
3.329	7.225	
4.023	7.452	
4.279	8.047	
4.770	8.289	
5.043	8.858	
5.468	9.118	

Errors ~0.020 No 4.42 level

56K44 L.M.Khromchenko, Zhur. Eksptl.' i Teoret. Fiz. 30, 681 (1956); Soviet Phys. JETP 3, 531 (1956).

Level $S^{(32)}$(polarized th n,γ)

(3.23) $J = 3/2^-$

From circular polarization of 5.43 capture γ

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956).

Resonance $S^{(32)}(n,n)$ n,n(θ)

E_o	J	l_n	Γ(kev)
(0.585)	≥5/2	≥2	1*

*Used $J = 5/2$ and $l_n = 2$

56L35 R.O.Lane, J.E.Monahan, Bull. Am. Phys. Soc. 1, No. 7, 346 X5 (1956).

$S^{34}_{16\ 18}$ Level $Cl^{(37)}(p,\alpha)$ $E_p = 3.77$

g.s. Q = +3.028 *6* sd 91°

57V03 D.M.Van Patter, W.C.Porter, M.A. Rothman, Phys. Rev. 106, 1016 (1957).

$S^{35}_{16\ 19}$ ^{87d} $\bar{E}_\beta = 0.052$ *3* β calorimeter

$\bar{E}_\beta$(calculated) for 0.167β = 0.0494

57S50 N.S.Shimanskaia, Zhur. Eksptl'. i Teoret. Fiz. 31, 393 (1956); Soviet Phys. JETP 4, 355 (1957).

β^- longitudinal polarization ($J = 3/2^+$ to $3/2^+$)

-0.38 *10* $E_\beta = 0.128$ (v/c = 0.6)

More spins antiparallel to direction of motion

Measured scattering of β's by gold foil after deflection by electric field

57L07 H.Langevin-Joliot, N.Marty, Compt. rend. 245, 870 (1957).

$_{17}Cl$ Relative isotopic abundances ms

No Cl^{31}, Cl^{32}, Cl^{33}, Cl^{34} (<0.02%)

No Cl^{36}, Cl^{38} (<0.07%)

56K38 L.Kerwin, D.E.McElcheran, Can. J. Phys. 34, 1497 (1956).

$Cl^{33}_{17\ 16}$ Capture γ's $S^{(32)}(p,\gamma)$ scin; p,$\gamma(\theta)$

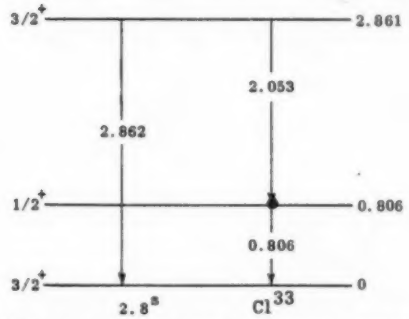
2.86 level $J = 3/2^+$ $E_p = 0.594$ *5*

50†	0.806 *4*	
49†	2.053 *15*	E2/M1 = 0.005 *3* or 4.1 *6*
51†	2.862 *15*	E2/M1 = 0.10 *1* or 500 *200*

(0.806 γ)(2.053γ) No (0.806 γ)(2.862γ)

$\Gamma_p\Gamma_\gamma/(\Gamma_p + \Gamma_\gamma) = 0.10$ *3* ev

p,$\gamma(\theta)$ consistent with $J = 3/2^+$ and $1/2^+$ for g.s. and 0.806 level in Cl^{33} resp.



56V23 C. Van der Leun, P.M.Endt, Physica 22, 1234 (1956).

$Cl^{34}_{17\ 17}$ $^{1.5s}$ g.s. β^+ longitudinal polarization ($J = 0^+$ to 0^+)

>0 $E_\beta = 3.0$ (v/c = 0.99)

More spins parallel to direction of motion

Measured circular polarization of high energy γ's from annihilation in flight

Data compatible with complete polarization

57D23 M.Deutsch, B.Gittelman, R.W.Bauer, L.Grodzins, A.W.Sunyar, Phys. Rev. 107, 1733 (1957).

$Cl^{34}_{17\ 17}$ ^{32m} $\gamma(S^{34})$ (1.14) (3.22) scin

(2.10) ~0.2% (4.0)

56M67 H.Morinaga, E.Bleuler, Phys. Rev. 103, 1423 (1956); Phys. Rev. 99, 658A (1955)

$Cl^{35}_{17\ 18}$ Ground state

μ_3 -0.0188 *3* M

Recalculated from data of J.H.Holloway*; polarization effects not included

57S28 C.Schwartz, Phys. Rev. 105, 173 (1957); *J.H.Holloway, Thesis, M.I.T. (1956).

$Cl^{36}_{17\ 19}$ $^{3.1x10^5y}$ τ 2.5×10^{5y} 4 $Cl^{(35)}(n,\gamma)$ chem

GM specific activity

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

Cl^{36} 17 19

Levels $Cl^{(35)}(d,p)$ E_d = 4 cyc ppl d,p(θ)

Level	l_n	Level	l_n
g.s.	2		
0.40?			
0.77	2?	3.64	1
1.20	0	4.02	2
1.52	0	4.40	
1.94	0,3?	4.75?	
2.43	2	5.14	
2.87, 3.26	1,3	5.88	

56T34 I.B.Teplov, Zhur. Eksptl.' i Teoret. Fiz. 31, 25 (1956); Soviet Phys. JETP 4, 31 (1957).

Resonances Cl^{35}(n) E_n = 0.03 to 15000 ev (Excitation = 8.6 Mev)

Γ(ev)	E_o(ev)		cryst, chopper
	−140 5	J = 2*	Γ_p^o = 0.72 ev
			Γ_γ = 0.48 ev
<0.6	405 6	σ_o > 580	Γ_n = 0.14 ev§
~800	8700 500		

*Calc σ_{incoh}(th n) = 7.8 7
(If J = 1, calc σ_{incoh} = 10.9 9)
Experimental data of others give σ_{incoh} = 3.9 3†
§If Γ = 0.6 ev, σ_o = 580

56B128 R.M.Brugger, J.E.Evans, E.G.Joki, R.S. Shankland, Phys. Rev. 104, 1054 (1956); Bull. Am. Phys. Soc. 1, No. 4, 176 F11 (1956).

Cl^{37} 17 20

Ground state

μ_3 −0.0146 3 M

Recalculated from data of J.H.Holloway*; polarization effects not included.

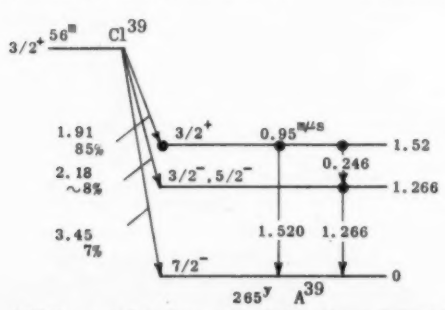
57S28 C.Schwartz, Phys. Rev. 105, 173 (1957); *J.H.Holloway, Thesis, M.I.T. (1956).

Cl^{39} 17 22 56^m

$A^{(40)}$(37-Mev α, αp) chem

β^-	85%	1.91 2	F-K linear		sl
	~8%	2.18			
	7%	3.45 2	ΔJ = 2, yes shape		
$\gamma(A^{39})$	90†	0.246 3	α < 0.0021		scin, sl ce
	100†	1.266 10	α < 0.0016		
	85†	1.520 10	α < 0.0032		

No γ with E_γ > 1.52 (<0.65†)
(1.91β)(1.266, 1.520γ) delay = 0.95$^{m\mu s}$ 5 scin
(1.91β)(0.246γ) No (3.45β)γ
(0.246γ)(1.266γ) delay < 0.5$^{m\mu s}$ No (1.520γ)γ



56P38 J.R.Penning, H.R.Maltrud, J.C.Hopkins, F.H.Schmidt, Phys. Rev. 104, 740 (1956); Bull. Am. Phys. Soc. 1, No. 4, 162 B2 (1956).

A 18

Relative isotopic abundances ms
No A^{34}, A^{35}, A^{39}, A^{41}, A^{43} (<0.01%)

56K32 L.Kerwin, Can. J. Phys. 34, 1080 (1956).

A^{35} 18 17 1.8s

τ	1.83^s 3	$Cl^{(35)}$(10-Mev p,n)	
β^+	~7% {(3.23)*, (3.77)*}		sl
	~93% 4.96 4		
$\gamma(Cl^{35})$			
	~3† 1.19 4		scin
	1† 1.73 4		

*Energy inferred from E_γ

56K29 O.C.Kistner, A.Schwarzschild, B.M. Rustad, Phys. Rev. 104, 154 (1956); Bull. Am. Phys. Soc. 1, No. 1, 30 H3 (1956).

$S^{(32)}$(α,n) chem

$\beta^+\nu(\theta)$ = 1 + (0.70 17)<v/c> cosθ EA Cl^{35} recoil
= 1 + (0.9 3)<v/c>cosθ (EA Cl^{35})(scin β)

Angular correlation coefficient calculated from Cl^{35} recoil spectrum. Results consistent with VT or VA type, not with ST or SA type for β-decay interaction

57H47 W.B.Herrmannsfeldt, D.R.Maxson, P.Stähelin, J.S.Allen, Phys. Rev. 107, 641 (1957).

A^{36} 18 18

Levels $Cl^{(35)}$(p,γ)

E_o	Level	J	
	(1.95)	2*	scin
	(4.1)	3*	
(0.855)	(9.2)	3*	
(1.510)	(9.86)	1± or 2−?	scin p,$\gamma_o(\theta)$

*From analysis of p,$\gamma(\theta)$ for 1.95, 2.15, 5.1, 7.2γ's and (5.1γ)(2.15γ)(θ) at E_p = 0.855

57B53 R.Berenbaum, J.H.Matthews, Proc. Phys. Soc. 70A, 445 (1957).

Capture γ's $Cl^{(35)}$(p,γ) scin 0°, 90°

9.2 level E_p = 0.855 5 (2J + 1)Γ_γ = 10 ev

~1	†	0.77		{4.1
11	2†	1.95	5 1†	{4.3
9	2†	2.15	10 2†	5.1
~2	†	~3	≲0.5 †	7.2

(5.1γ)(1.95, 2.15, 4.1γ) (1.95γ)(2.15γ)
(0.77γ)(1.95, 2.15γ)?

9.83 level E_p = 1.484 5 (2J + 1)Γ_γ = 8 ev

≳90%	9.9	

9.86 level E_p = 1.510 5 (2J + 1)Γ_γ = 32 ev

≳90%	9.9	

9.93 level E_p = 1.580 5 (2J + 1)Γ_γ = 22 ev

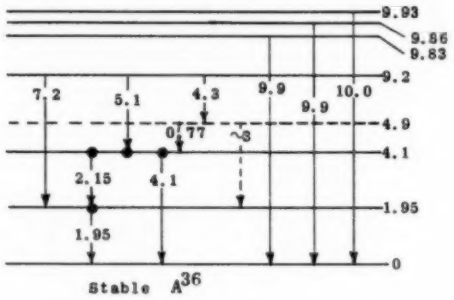
≳90%	10.0	

Continued

A^{36} 18 18

Continued

Capture γ's $Cl^{(35)}(p,\gamma)$ scin 0°,90°



57T21 J.H.Towle, R.Berenbaum, J.H.Matthews, Proc. Phys. Soc. 70A, 84 (1957).

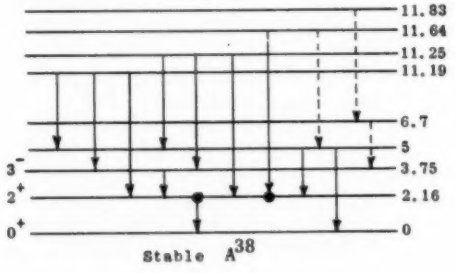
A^{38} 18 20

Levels $Cl^{(37)}(p,\gamma)$ scin 0°

E_o	Level*	$(2J+1)\Gamma_\gamma$(ev)
1.070 5	11.19	9
1.135 5	11.25	14
1.533 5	11.64	28
1.725 5	11.83	

*Based on g.s. Q=+10.15 15

Capture γ's $Cl^{(37)}(p,\gamma)$ scin 0°



57T21 J.H.Towle, R.Berenbaum, J.H.Matthews, Proc. Phys. Soc. 70A, 84 (1957).

Level $Cl^{(37)}(p,\gamma)$ scin

E_o	Level	J	p, $(9.5\gamma)(\theta)$
(1.533)	(11.64)	$2^{\pm}$ or $3^{\mp}$?	A_2 =+0.27 3

57B53 R.Berenbaum, J.H.Matthews, Proc. Phys. Soc. 70A, 445 (1957).

A^{40} 18 22

Levels $A^{(40)}(e,e')$ E_e = 187

1.46	$J=0^+$?	s 50°,60°
2.4	$J=2^+$?	s 50° to 70°
	$\tau\sim0.23^{\mu\mu}$s	for 2.4γ

J from comparison with "universal" form factor curves; τ from analysis of $\sigma(e,e')$

56H83 R.H.Helm, Phys. Rev. 104, 1466 (1956).

A^{41} 18 23 1.8^h

τ		1.85^h 2	$A^{(40)}$(pile n,γ)
β^-	99.1%	1.199 8	F-K linear (E_β>0.15)
	0.88%	2.48 4	ΔJ = 2, yes shape s77, s1
$\gamma(K^{41})$		1.290 5	scin

56S97 A.Schwarzschild, B.M.Rustad, C.S.Wu, Phys. Rev. 103, 1796; Bull. Am. Phys. Soc. 1, No. 1, 30 H4 (1956).

K 19

Relative isotopic abundances ms

K^{39}	93.13% 5
K^{40}	0.01174% 4
K^{41}	6.86% 5

56R35 C.Reuterswärd, Arkiv Fysik 11, 1 (1956).

Capture γ's $K(n,\gamma)$ E_n = th; s77 Cp

3†	0.625 10	~4†	2.75 4
7†	1.180 15	~3†	3.05 3
~2†	1.40 2	~2†	3.55 5
5†	1.51 1	~1†	4.50 4
~3†	2.37?	~1†	4.70 3
~2†	2.42?	~3†	5.65?
~4†	2.55?	0.2†	7.320 25

27 other γ's assigned to K^{41}, q.v.

†Photons/100 K captures (max. in K^{40} 95.5†, K^{41} 0.4†, K^{42} 4.1†)

56A49 V.P.Adyasevich, L.V.Groshev, A.M. Demidov, B.N.Lutsenko, Atom. Energiya 1, No. 2, 28 (1956); J. Nuclear Energy 3, 325 (1956).

K^{39} 19 20

Ground state

q +0.07 2 M

56B119 P.Buck, I.I.Rabi, B.Senitzky, Phys. Rev. 104, 553 (1956).

Ground state

μ +0.40 2 double res

q +0.11 2

57R37 G.J.Ritter, G.W.Series, Proc. Roy. Soc. 238, 473 (1957); Phys. Rev. 105, 1128 (1957); Proc. Phys. Soc. 68A, 450 (1955).

K^{40} 19 21

Capture γ's $K^{(39)}(n,\gamma)$ E_n = th; s77 Cp

(Excitation = 7.79 Mev)

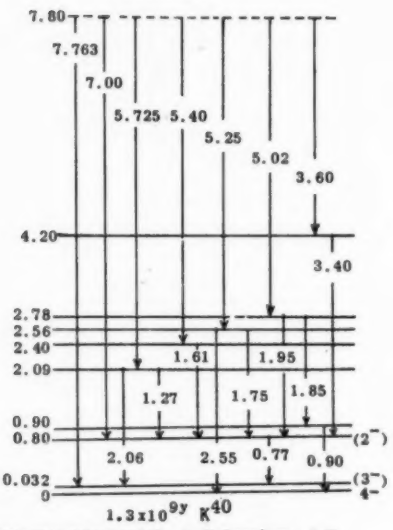
26†	0.770 7	~3†	2.30?	5†	4.39 2		
2†	0.900 15	~4†	2.60?	1.5†	4.810 35		
~2†	1.27 2	~1.5†	3.15?	4.5†	5.02 3		
13†	1.610 8	~4†	3.40 5	2.5†	5.25 5		
~3†	1.75 2	4†	3.60 3	6.4†	5.40 2		
~3†	1.85 2	4†	3.70 3	~2†	5.515 30		
4†	1.95 2	2†	3.81 5	11†	5.725 15		
7†	2.020 15	4†	3.97 5	1.6†	7.000 15		
9†	2.06 1	5†	4.11 3	4.4†	7.763 10		

†Photons/100 K captures See also K

Continued

K^{40}
19 21

Continued



56A49 V.P.Adyasevich, L.V.Groshev, A.M. Demidov, B.N.Lutsenko, Atom. Energiya 1, No. 2, 28 (1956); J.Nuclear Energy 3, 325 (1956).

K^{42}
19 23
12.5^h

τ 12.46^h 7 $K^{(41)}(n,\gamma)$ chem
Decay followed for 4 half-lives pc, ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

K^{43}
19 24
22^h

$\gamma(Ca^{43})$		V(190 Mev-p)
	(0.219)	
	0.3737 4	sd pe
	(0.393)	
	0.6189 6	sd pe
	1.02 10	

(0.374γ)(0.219, 0.619, 1.02γ) scin $\gamma\gamma$
(0.619γ)(0.374γ only)
(1.02γ)(0.374γ only)

57B07 G.Bäckström, T.Lindqvist, Arkiv Fysik 11, 465 (1957).

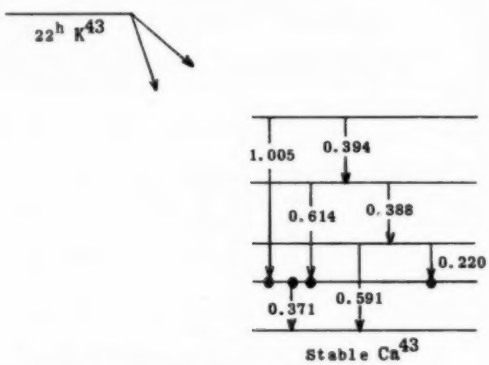
$\gamma(Ca^{43})$		$A^{(40)}(\alpha,p)$
<5†	0.220 5	scin
100†	0.371 2	scin, sl pe
14†	0.388 2	
16†	0.394 2	
23†	0.591 3	
91†	0.614 4	
3.5†	1.005 10	scin

(~0.37γ)(0.220, ~0.37, ~0.60, 1.005γ)
(~0.60γ)(~0.37γ) (1.005γ)(~0.37γ)

Continued

K^{43}
19 24
22^h

Continued



57B41 N.Benczer-Koller, A.Schwarzschild, C.S. Wu, Bull. Am. Phys. Soc. 2, No. 1, 24 G2 (1957).

Ca
20

Relative isotopic abundances ms

Ca^{40}	97.01% 22	Ca^{44}	2.01% 2
Ca^{42}	0.67% 5	(Ca^{46}	0.003%)
Ca^{43}	0.15% 1	Ca^{48}	0.16% 2

56A50 P.A.Akishin, G.M.Panchenkov, N.N. Vasil'ev, O.T.Nikitin, Zhur. Fiz. Khim. SSSR 30, 1387 (1956); Chem. Abstr. 51-6385f (1957).

Level $Ca(n,n')$ $E_n = 4.4$
g.s. $\sigma(90°) = 49$ 12 mb/sr ppl
No level observed below 3.35

56W36 J.B.Weddell, Phys. Rev. 104, 1069 (1956).

Capture γ's	$Ca(n,\gamma)$	E_n = th
≥4.8†	~1.2	sm Cp
≥3.2†	~1.48	
≥3.6†	1.790 15	
0.9†	5.150 35	
1.2†	5.500 35	

15 other γ's assigned to Ca^{41}, q.v.
γ intensity difference from Ca(n,γ) and $Ca^{40}(n,\gamma)$ implies $\sigma[Ca^{42}(n,\gamma)] = 6.6^{+3}_{-6}$. Value of others, 39^{+5}_{-1}, gives max. photon intensities in Ca^{41} 40†, Ca^{43} 57†, Ca^{45} 2.7†, Ca^{49} 0.5†
†Photons/100 Ca captures

56A49 V.P.Adyasevich, L.V.Groshev, A.M. Demidov, B.N.Lutsenko, Atom. Energiya 1, No. 2, 28 (1956); J. Nuclear Energy 3, 325 (1956).

Ca^{40}
20 20

Levels $K^{(39)}(p,\gamma)$ E_p = 0.5 to 1.2 CcW
g.s. Q = +8.17 3 scin pr

121†	9.03 1	9.13 1	
100†	9.07 1	101† 9.29 1	

9.29 level $E_o = 1.150$ 10

γ		
	0.500 5	scin
	3.730 5	scin pr
	5.550 5	
21*	5.930 5	
100*	9.290 5	E1 from p,$\gamma(\theta)$

*Relative γ intensities. Single-particle model predicts 27 : 100. †Relative cross sections.

57D18 J. de Veiga Simão, J.P.F.Sellschop, Phys. Rev. 106, 98 (1957).

$Ca^{40}_{20\ 20}$

Level — $Ca^{(40)}(n,n'+e^+e^-)$ pulsed n's

(3.35) $\tau = 2.4^{+1.5}_{-3}$ mμs scin $\gamma^{\pm}$

57K29 R.M.Kloepper, R.B.Day, D.A.Lind, Bull. Am. Phys. Soc. 2, No. 1, 60 U6 (1957); verbal report.

Level — $Ca^{(40)}(e,e')$ E_e = 183 s 50° to 110°

(3.73) $J = 3^-$ $\tau = 49^{+\infty}$ mμs for 3.73γ

J from comparison with "universal" form factor curves; τ from analysis of σ(e,e')*

56H85 R.H.Helm, Phys. Rev. 104, 1466 (1956); *B.Hahn, D.G.Ravenhall, R.Hofstadter, Phys. Rev. 101, 1131 (1956).

Levels — $K^{(39)}(p,\gamma)$ scin

E_o	Level	J	$p,\gamma_o(\theta)$
(1.120)	(9.45)	$1,(2^-)$	$A_2 = +0.44$ 3
(1.300)	(9.65)	$1,(2^-)$	$A_2 = +0.43$ 3
(1.566)	(9.9)	$1,(2^-)$	$A_2 = +0.07$ 3

57B53 R.Berenbaum, J.H.Matthews, Proc. Phys. Soc. 70A, 445 (1957).

Capture γ's — $K^{(39)}(p,\gamma)$ scin

9.45 level $E_p = 1.120$ 5 $(2J+1)\Gamma_\gamma = 4$ ev

14	†	3.8	9	4†	6.1
4	2†	5.6	100	†	9.5

9.65 level $E_p = 1.300$ 5 $(2J+1)\Gamma_\gamma = 8$ ev

65	†	3.8			
≲5	†	5.2	5	3†	6.3
6	3†	5.8	100	†	9.65

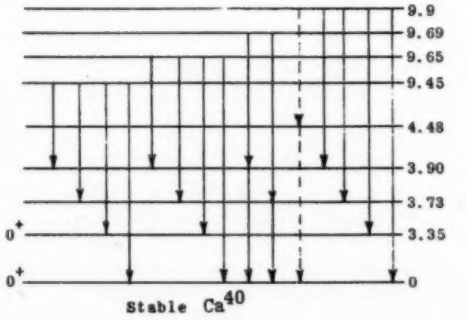
9.69 level $E_p = 1.338$ 5

100	†	3.7 3.9	35	†	5.96
65	†	5.79	<5	†	9.7

9.9 level $E_p = 1.566$ 5 $(2J+1)\Gamma_\gamma = 14$ ev

25	†	3.8	17	6†	6.1
8	4†	~4.5	17	6†	6.6
8	4†	~5.4	100	†	9.9

Capture γ's — $K^{(39)}(p,\gamma)$ scin



57T21 J.H.Towle, R.Berenbaum, J.H.Matthews, Proc. Phys. Soc. 70A, 84 (1957).

$Ca^{41}_{20\ 21}$

Levels — $Ca^{(40)}(d,p)$ E_d = 2.5 to 7.0

g.s. Q = +6.140 9 s 90°

1.947 4			
2.014 5	3.206 6	3.837 7
2.469 5	3.375 7	3.854 7
2.584 6	3.405 7	3.921 7
2.612 6	3.500 7	3.950 7
2.677 6	3.531 7	3.982 7
2.890 6	3.619 7	4.023 7
2.967 6	3.682 7	4.101 7
3.056 6	3.736 7	4.194 7

56B102 C.M.Braams, Phys. Rev. 103, 1310 (1956).

Level — $Ca^{(40)}$(polarized th n,γ)

(1.95) $J = 3/2^-$

From circular polarization of 6.42 capture γ

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956).

Capture γ's — $Ca^{40}(n,\gamma)$ E_n = th

(Excitation = 8.37 Mev) scπ Cp

≥9†	0.463 10	1.8†	3.762 20
≥5†	0.532 10	12.3†	4.418 15
6.4†	1.844 15	2.5†	4.764 30
39†	1.944 8	2.3†	4.944 30
12.7†	2.004 10	1.2†	5.696 30
≥2.0†	2.660 50	3.8†	5.904 30
≥3.6†	2.810 35	22†	6.406 15
6.4†	3.60 1	No 8.37γ (<0.02†)	

Many unresolved γ's with $E_\gamma < 4$

†Photons/100 Ca captures (max in Ca^{41} = 40†)

56A49 V.P.Adyasevich, L.V.Groshev, A.M. Demidov, B.N.Lutsenko, Atom. Energiya 1, No. 2, 28 (1956); J.Nuclear Energy 3, 325 (1956).

$Ca^{43}_{20\ 23}$

Levels — $Ca^{42}(d,p)$ E_d = 7.0

g.s. Q = +5.711 10 s d,p(θ)

$Ca^{43}(p,p')$ E_p = 5.0 to 7.4

l_n	θ[a]	Yield[b]	Level	l_n	θ[a]	Yield[b]	Level
3	35°	100†	g.s.	1	20°	84†	2.607 5
		<7†	0.373 3			<14†	2.673 5
1	20°	36†	0.593 3			<14†	2.696 5
2	35°	14†	0.991 3			<17†	2.753 5
		<4†	1.394 4			<17†	2.844 5
		<10†	1.678 4	1	15°	61†	2.880 5
		<7†	1.904 4	1	15°	61†	2.947 5
		<7†	1.932 4			<11†	3.027 6
0	10°	100†	1.957 5			<11†	3.047 6
		<23†	1.985 5			<11†	3.074 6
1	20°	750†	2.048 5			<7†	3.094 6
		<270†	2.069 5			<27†	3.194 6
		<29†	2.095 5			<22†	3.279 6
		<23†	2.107?5		- 15°	53†	3.293 6
		<23†	2.225 5			<14†	3.369?6
		<14†	2.250 5			<31†	3.398?6
		<11†	2.273?5			<31†	3.419 6
		<11†	2.409 5	1,2	15°	64†	3.584
1	20°	13†	2.53?				

$\sigma(Ca^{43})/\sigma(Ca^{41}) = 0.68$ 5 for (d,p_0), $\theta = 10°$ to 60°

[a]Angle of maximum (d,p) yield

[b]Rel. yield at maximum of d,p(θ)

57B99 C.K.Bockelman, C.M.Braams, C.P.Browne, W.W. Buechner, R.R.Sharp, A.Sperduto, Phys. Rev. 107, 176 (1957); C.M.Braams, Phys. Rev. 105, 1023 (1957); 95, 650A (1954).

Ca^{45} 20 25 153^d

τ **153**^{d} *2* Sc^{45}(n,p) chem

3 samples counted for 0.7 half-life each

57T11 H.Thiry, Bull. Soc. Roy. Sci. Liège 26, 29 (1957).

Ca^{45} 20 25

Levels l_n	θ^a	Yield^b	Ca^{44}(d,p) Level	l_n	θ^a	Yield^b	E_d = 7.0 Level
3	40°	100†	**g.s.**	–	20°	4†	**2.681** *5*
–	50°	3†	**0.176** *3*			< 8†	**2.763?***5*
		< 11†	**1.036?***10*	1,2	20°	212†	**2.844** *5*
1	20°	200†	**1.432** *4*			< 5†	**2.950** *5*
		< 7†	**1.475?***6*	–	10°	20†	**2.970** *5*
		< 6†	**1.557?***10*			< 10†	**3.032?***6*
1	20°	1150†	**1.902** *4*			< 5†	**3.148** *6*
–	50°	3†	**1.971** *4*	1,2	20°	104†	**3.244** *6*
1	15°	190	**2.249** *5*			< 4†	**3.296** *6*
–	30°	2†	**2.356** *5*	–	40°	19†	**3.319** *6*
0 < 7.5°		190†	**2.394** *5*	1,2	15°	430†	**3.419** *6*
		< 4†	**2.597?***5*				

[a]Angle of maximum (d,p) yield

[b]Rel. yield at maximum of d,p(θ)

57C60 W.R.Cobb, D.B.Guthe, Phys. Rev. 107, 181 (1957); C.M.Braams, Phys. Rev. 95, 650A (1954) and Thesis, Utrecht (1956).

Ca^{47} 20 27 4.7^d

τ **4.7**^{d} *1* Ca^{46}(pile n,γ) chem

V(380-Mev p) chem

β^- 83% **0.66** *1* sl

17% **1.94** *2*

$\gamma(Sc^{47})$ 1† **0.48** *2* scin

1† **0.83** *2*

13† **1.31** *2*

(0.48 γ)(0.83γ) No(1.31γ)γ

No β with E_β = 1.0 to 1.5 (< 3%)

56L38 L.J.Lidofsky, V.K.Fischer, Phys. Rev. 104, 759 (1956); 99, 658A (1955).

Ca^{48} 20 28

τ_β $>7 \times 10^{14}$y if $\tau(Sc^{48*}) > 2^h$

$>2 \times 10^{14}$y if $\tau(Sc^{48*}) = 1^h$

No active Sc was separated chemically from Ca

*Possible Sc^{48} isomer which could be d Ca^{48}

56J32 J.W.Jones, NYO 6627 (1956).

$\tau_{\beta\beta}$ $>1 \times 10^{18}$y 76%Ca^{48}; 2π scins

From number of coincident pulses per 100 hours with energy between 3.5 and 5.1 Mev:

10.6 *19* for Ca^{48}, 8.2 *16* for Ca^{40} standard

56D47 E.I.Dobrokhotov, V.R.Lazarenko, S.I. Luk'ianov, Doklady Akad. Nauk. SSSR 110, 966 (1956); Soviet Phys. Doklady 1, 600 (1956).

Sc^{41} 21 20

Levels $Ca^{(40)}$(p,p′ +e^+e^-) [E_p = 4.1 to 6.0 scin pr

E_o	Level	$\gamma_p^{2\prime,*}$	$\gamma_p^{2,*}$
4.42	**5.94**	13	
4.74	**6.25**	5	
4.90	**6.41**	0.5	
5.02	**6.53**	21	2.9
5.09	**6.60**	25	2.6

D = 170 kev

$\gamma_p^{2\prime}/D = 8 \times 10^{-14}$ cm

*Reduced width in 10^{-12} kev cm assuming $l = 0$

15 additional resonances from E_p = 5.25 to 6.00

57B48 R.D.Bent, T.H.Kruse, L.J.Lidofsky, Bull. Am. Phys. Soc. 2, No. 4, 179 D10 (1957); verbal report.

Resonances $Ca^{(40)}$(d,p_o) E_d = 1.50 to 4.22 (Excitation ~11.1 to 13.7) 30°,90°,150°

At least 30 resonances with $\Gamma \leq 0.03$

d,p(θ) shows general forward peaking

57L24 L.L.Lee,Jr., J.P.Schiffer, Bull. Am. Phys. Soc. 2, No. 4, 208 P9 (1957).

Sc^{45} 21 24

Levels Sc^{45}(p,p′)	E_p = 4.5,5.0,5.6 sπ 180°	
0.377 *3*		
0.541 *3*		
0.722 *5*	**1.235** *5*	
0.860?	**1.409** *5*	
0.972 *4*	**1.432** *5*	
1.06 ?	**1.661** *5*	

56W30 P.M.Windham, C.R.Gossett, G.C. Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Sc^{46} 21 25 84^d g.s.

τ **84.1**^{d} *3* $Ti^{(46)}$(pile n,p) chem

56S87 R.P.Schuman, M.E.Jones, A.C.Mewherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

τ **82.9**^{d} *15* Co^{59}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala, 1956.

τ **83.89**^{d} *12* Sc^{45}(pile n,γ)

Decay followed for 5.5 half-lives ic γ

57G07 K.W.Geiger, Phys. Rev. 105,1539 (1957).

τ **84.2**^{d} *2* Sc^{45}(n,γ)

Decay followed for 3.8 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

Sc^{46} 21 25 84^d g.s.

β^- longitudinal polarization ($J = 4^+$ to 4^+)
-0.34 *10* $E_\beta = 0.12$ (v/c = 0.6)
More spins antiparallel to direction of motion
Measured Møller scattering of β's by magnetized Deltamax foil scin ee

57F27 H.Frauenfelder, R.Bobone, E.von Goeler, N.Levine, H.R.Lewis,Jr., R.N.Peacock, A.Rossi, G.DePasquali, Phys. Rev. 107, 909 (1957).

β^-(right circular γ)(θ) = 1^+ (0.33 4)<v/c>cosθ
$J = 4(\neq 5)$, 4, 2, 0
γ ray shown to be circularly polarized by scattering from magnetized iron

57B95 F.Boehm, A.H.Wapstra, Phys. Rev. 107, 1202 (1957).

(1.12γ)(0.89γ) delay $\leq 10^{\mu\mu s}$ scin
Resolving time = $940^{\mu\mu s}$; Co^{60} comparison

56B145 G.Bertolini, Nuclear Phys. 2, 660 (1956).

Sc^{46} 21 25

Resonance Sc^{45}(n) E_n = 2.0 to 100.5 kev
(Excitation = 8.89 Mev) Li(p,n)

σ	E_o(kev)
116 5	4.10 25

57M10 H.Marshak, H.W.Newson, Phys. Rev. 106, 110 (1957).

Sc^{47} 21 26 3.4^d

τ		3.3^d *1*	d 4.7^dCa chem
β^-	74%	0.450 *10*	sl
	26%	0.610 5	
$\gamma(Ti^{47})$		0.160 5	scin
(0.450β)(0.160γ)		No (0.610β)(0.160γ)	scin

56L39 L.J.Lidofsky, V.K.Fischer, Phys. Rev. 104, 759 (1956); 99, 658A (1955).

NRC 57-2-40 Sc^{47} 57#1

Ti 22

Capture γ's Ti(th n,γ)

~40†	0.3408 *3*	10†	1.586 *4*		cryst
(87)†	1.378 *3*	5†	1.762 *4*		
7†	1.508 *6*	2†	1.797 *5*		
4†	3.028 *14*	8†	6.550 *8*		sπ pr
1.3†	3.23 *2*	(53)†	6.753 *5*		
2†	3.460 *15*	0.2†	6.947 *14*		
1.2†	3.55 *2*	0.3†	6.996 *10*		
3†	3.733 *14*	0.3†	7.149 *10*		
2.4†	3.916 *10*	0.5†	7.319 *10*		
0.5†	4.22 *2*	0.4†	7.386 *9*		
0.4†	4.38 *2*	0.05†	7.55 *2*		
2†	4.706 *13*	0.1†	7.628 *11*		
7†	4.871 *6*	0.04†	7.736 *13*		

Ti 22 Continued

5†	4.957 *6*	0.04†	7.844 *15*	
0.6†	5.460 *14*	0.1†	7.996 *12*	
0.7†	5.644 *12*	0.2†	8.252 *10*	
0.2†	5.89 *2*	0.06†	8.342 *11*	
0.1†	5.98 *2*	0.1†	9.189 *11*	
0.2†	6.07 *2*	0.09†	9.376 *12*	
38†	6.413 *5*	0.04†	10.621 *14*	

Study covered E_γ = 2.7 to 11
†Photons/100 captures (±15 to 50%)
(Max in Ti^{47}, Ti^{48}, Ti^{49}, Ti^{50}, Ti^{51} = 0.7†, 2.2†, 95† 1.7† 0.3†)

57M09 G.Manning, G.A.Bartholomew, P.J. Campion, J.W.Knowles, Bull. Am. Phys. Soc. 2, No. 4, 218 S8 (1957); verbal report.

Capture γ's Ti(th n,γ)

24†	0.350* *5*				sπ Cp
5.7†	1.03* *2*	2.1†	3.86* *2*		
2.8†	1.18 *2*	0.6†	4.30? *6*		
85†	1.390* *5*	2†	4.68* *3*		
5.2†	1.51* *1*	5.2†	4.873* *20*		
13†	1.60* *1*	2.7†	4.96* *2*		
7.5†	1.78* *2*	0.8†	5.67* *6*		
2.4†	2.08* *3*	27.5†	6.42* *2*		
2.85†	2.22* *3*	4†	6.56* *3*		
1.5†	2.83* *4*	38†	6.756* *10*		
1.5†	2.95* *4*	0.6†	7.16 *5*		
2.8†	3.02* *4*	0.3†	7.66 *4*		
1.3†	3.20 *4*	0.2†	8.31$ *5*		
2.6†	3.39* *3*	0.13†	9.17$ *7*		
1.2†	3.50* *3*	0.09†	9.39$ *5*		
2.4†	3.65* *2*	0.01†	10.47$ *15*		

Study covered E_γ = 0.25 to 12
†Photons/100 Ti captures (σ_a = 5.8)
(Max in Ti^{47}, Ti^{48}, Ti^{49}, Ti^{50}, Ti^{51} = 0.7†, 2.2†, 95†, 1.7†, 0.3†)
*Assigned to Ti^{49}
$Assigned to Ti^{48}. 9.39γ may also be in Ti^{50}

58A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

Ti^{44} 22 22 $\sim 10^3$y

Sc^{45}(20-Mev d,3n) chem
τ $\sim 10^3$y if σ(d,p)/σ(d,3n) = 2
$\gamma(Sc^{44})$ 1† 0.068 scin γ, $\gamma\gamma$
~1† 0.076
(0.068γ)(0.076γ) Σ scin, scin $\gamma\gamma$
(~0.07γ)/(3.9^hSc^{44} $\gamma^\pm$) = 1.1 2
No 0.144γ (<2%)
p 3.9^hSc^{44} chem (growth of $\gamma^\pm$ and 1.16γ)

57H84 J.R.Huizenga, J.Wing, Phys. Rev. 106, 90 (1957).

Ti^{46} 22 24

Level $Ti^{46}(\alpha,\alpha'\gamma)$ E_α = 6
0.890 *9* $\tau = 9.0^{\mu\mu s}$ *14* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

$Ti^{47}_{22\ 25}$ Reaction γ's $Ti^{47}(\alpha,\alpha'\gamma)$ $E_\alpha = 1.2$ to 3.4

0.160 *2*	$\epsilon B(E2) = 0.040$ *6*	scin γ
0.730* *7*		
1.02* *1*		

*May be due to $(\alpha,n\gamma)$ or $(\alpha,p\gamma)$ reactions

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 96, 426; 93, 351 (1954).

Reaction γ's $Ti^{47}(n,n'\gamma)$ $E_n = 1.4$, 4.4

0.16	scin
1.344 *15*	

No 1.18, 1.50γ

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

$Ti^{48}_{22\ 26}$ Level $Ti^{48}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.99 *1*	$\tau = 9.7^{\mu\mu s}$ *15*	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Capture γ's $Ti^{(47)}$(th n,γ) sπ pr

(Excitation = 11.61 Mev)*

~0.06†	**8.342** *11*			
0.01†	**9.189** *11*			
0.04†	**10.621** *14*			

E_γ requires assignment to Ti^{48} or Ti^{50}. $E_3 - E_1$ fits level difference in Ti^{48}. 9.189γ requires 2.42 level in Ti^{48} or 1.77 level in Ti^{50}

For other possible γ's see Ti

*Q(d,p) = 11.36

†Photons/100 Ti captures (max in Ti^{48} = 2.2†)

57M09 G.Manning, G.A.Bartholomew, P.J. Campion, J.W.Knowles, Bull. Am. Phys. Soc. 2, No. 4, 218 S8 (1957); verbal report.

Capture γ's $Ti^{(47)}$(th n,γ) sπ Cp

0.2†	**8.31** *5*	0.09†	**9.39*** *5*	
0.13†	**9.17** *7*	0.01†	**10.47** *15*	

†Photons/100 Ti captures (σ_a = 5.8)

(Max in Ti^{47}, Ti^{48}, Ti^{49}, Ti^{50}, Ti^{51} = 0.7†)

2.2†, 95†, 1.7†, 0.3†)

Isotopic assignments from intensities and energetics

*May also be in Ti^{50}

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

$Ti^{48}_{22\ 26}$ Reaction γ's $Ti^{48}(n,n'\gamma)$ $E_n = 4.4$

500†	**0.998** *10*	scin
87†	**1.329** *10*	
55†	**1.449** *18*	

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

$Ti^{49}_{22\ 27}$ Levels $Ti^{(48)}$(polarized th n,γ)

(1.38)	$J = 3/2^-$
(1.73)	$J = 1/2^-$

From circular polarization of 6.75 and 6.41 capture γ's

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956).

Capture γ's $Ti^{(48)}$ (th n,γ)

(Excitation = 8.13 Mev)

~40†	**0.3408*** *3*	10†	**1.586*** *4*	cryst	
(87)†	**1.378*** *3*	5†	**1.762*** *4*		
7†	**1.508*** *6*	2†	**1.797*** *5*		
4†	**3.028** *14*	7†	**4.876*** *6*	sπ pr	
2†	**3.460** *15*	5†	**4.957*** *6*		
3†	**3.733** *14*	38†	**6.413*** *5*		
2.4†	**3.916** *10*	8†	**6.550*** *8*		
2†	**4.706** *13*	(53)†	**6.753*** *5*		

Assignments from intensities. See Ti.

†Photons/100 Ti captures (±25% cryst, ±15% sπ)

57M09 G.Manning, G.A.Bartholomew, P.J. Campion, J.W.Knowles, Bull. Am. Phys. Soc. 2, No. 4, 218 S8 (1957); verbal report.

Capture γ's $Ti^{(48)}$(th n,γ) sπ Cp

24†	**0.350** *5*	2.6†	**3.39** *3*		
5.7†	**1.03** *2*	1.2†	**3.50** *3*		
85†	**1.390** *5*	2.4†	**3.65** *2*		
5.2†	**1.51** *1*	2.1†	**3.86** *2*		
13†	**1.60** *1*	2†	**4.68** *3*		
7.5†	**1.78** *2*	5.2†	**4.875** *20*		
2.4†	**2.08** *3*	2.7†	**4.96** *2*		
2.85†	**2.22** *3*	0.8†	**5.67** *6*		
1.5†	**2.83** *4*	27.5†	**6.42** *2*		
1.5†	**2.95** *4*	4†	**6.56** *3*		
2.8†	**3.02** *4*	38†	**6.756** *10*		

Study covered E_γ = 0.25 to 12

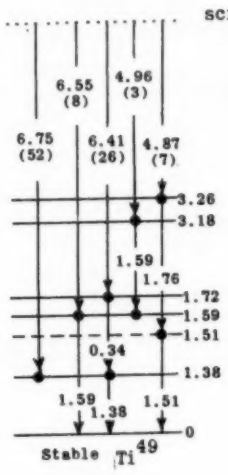
†Photons/100 Ti captures (σ_a = 5.8)

(Max in Ti^{47}, Ti^{48}, Ti^{49}, Ti^{50}, Ti^{51} = 0.7†, 2.2†, 95†, 1.7†, 0.3†)

Isotopic assignments from intensities and energetics

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Atom. Energiya 1, No. 2, 40 (1956).

$Ti^{49}_{22\ 27}$ Capture γ's $Ti^{(48)}(n,\gamma)$



Numbers in parentheses are photons/100 Ti captures (max in Ti^{49} = 95)

57S38 R.E.Segel, Bull. Am. Phys. Soc. 2, No. 4, 230 V3 (1957); verbal report.

Reaction γ $Ti^{49}(\alpha,\alpha'\gamma)$ E_α = 6
1.44 *14* scin

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956).

$Ti^{50}_{22\ 28}$ Capture γ's $Ti^{(49)}$(th n,γ) sπ pr
(Excitation = 10.96 Mev)
~0.09† 8.252 *10*
~0.2† 9.376 *12*
E_γ requires assignment to Ti^{48} or Ti^{50}
γ's fit above excitation and known Ti^{50} levels
For other possible γ's see Ti
†Photons/100 captures (max in Ti^{50} = 1.7†)

57M09 G.Manning, G.A.Bartholomew, P.J. Campion, J.W.Knowles, Bull. Am. Phys. Soc. 2, No. 4, 218 S8 (1957); verbal report.

Reaction γ $Ti^{50}(n,n'\gamma)$ E_n = 4.4
1.595 *14* scin

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

$V^{?}_{23}$ 1.4^{ms}
τ 1.4ms Ti(20-Mev p)
γ ~1 scin

56L46 O.I.Leipunskii, V.V.Miller, A.M.Morozov, P.A.Iampol'skii, Doklady Akad. Nauk SSSR 109, 935 (1956); Soviet Phys. Doklady 1, 505 (1956).

$V^{46}_{23\ 23}$ 0.4^{s}
τ 0.37s *5* $Ti^{(46)}$(20-Mev p,n); scin

56L46 O.I.Leipunskii, V.V.Miller, A.M. Morozov, P.A.Iampol'skii, Doklady Akad. Nauk SSSR 109, 935 (1956); Soviet Phys. Doklady 1, 505 (1956).

$V^{47}_{23\ 24}$ 31m
τ 32.0m *3* Co^{59}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala, 1956.

Sc^{45}(30-Mev α,2n)
No 0.160γ (<0.8%) scin $\gamma,\gamma\gamma$‡

56L39 L.J.Lidofsky, V.K.Fischer, Phys. Rev. 104, 759 (1956).

$V^{48}_{23\ 25}$ 16d
$Cr^{(50)}$(≤15-Mev d,α) chem
τ 15.99d *8*

56K33 P.Kafalas, J.W.Irvine, Jr., Phys. Rev. 104, 703 (1956).

τ 16.18d *5* Co^{59}(170-Mev p) chem

56R45 G.Rudstam, Thesis Univ. Uppsala (1956).

$V^{49}_{23\ 26}$ 330d
τ 327d *20* $Ti^{(48)}$(15-Mev d,n) chem
E_ϵ 0.621 *10* scin γ-continuum
Shape of continuous γ spectrum agrees with predictions of Glauber and Martin*
No γ ($<10^{-3}$%)

56H59 R.W.Hayward, D.D.Hoppes, Phys. Rev. 104, 183 (1956); 99, 659A (1956); *R.J. Glauber, P.C.Martin, Phys. Rev. 104, 158 (1956).

$V^{49}_{23\ 26}$ 330d ground state V^{49}/V^{51}~0.005
J 7/2 para
$|\mu|$ 4.46
$|\mu(V^{49}/\mu(V^{51})| = 0.867$ *10*

57W17 M.M.Weiss, R.I.Walter, O.R.Gilliam, V.W.Cohen, Bull. Am. Phys. Soc. 2, No. 1, 31 JA9 (1957).

$V^{50}_{23\ 27}$ $4x10^{14}$y
τ_ϵ 4.0×10^{14}y *11* natural V
From observation of Compton edge (but not photo peak) of 1.58γ scin
$\tau_{\epsilon K}$ $>4.0 \times 10^{13}$y (no K x ray) pc
τ_β $>2.4 \times 10^{14}$y (no β with E_β>0.05) pc

57G21 R.N.Glover, D.E.Watt, Phil. Mag. 2, 697 (1957).

460722 O-58-4

V^{50} 23 27

Reaction γ $V^{50}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$

0.225 2 $\epsilon B(E2) = 0.011$ 2 scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164, C3 (1956).

Reaction γ $V^{50}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.4$; scin γ

0.226 2 $\epsilon B(E2) = 0.011$ 2

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

V^{51} 23 28

Reaction γ $V^{(51)}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.0$

0.320 3 $\epsilon B(E2) = 0.0055$ scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 96, 433; 93, 351 (1954).

Reaction γ $V^{(51)}(N^{14},N^{14'}\gamma)$ $E_{N14} = 15.6$

0.320 6 scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

V^{52} 23 29

Resonances $V^{(51)}(n)$ $E_n = 1.6$ to 100.5 kev, (Excitation $\geq$ 7.30 Mev) Li(p,n)

σ	E_o(kev)	J	Γ(kev)
158 6	**4.10** 25		
104 4	**6.60** 25		
81 3	**11.50** 25		
39.0 15	**16.60** 25		
26 1	**22.10** 25		
26 1	**69.1** 7	4	5.0
15.0 5	**87.1** 9	3	3.0

D **10** kev E_n = 0 to 25 kev

$\overline{\Gamma_n^\circ}/D$ **4.7×10^{-4}** 4

if σ_s(potential) = $4\pi R^2$; $R = 1.45A^{1/3}$

57M10 H.Marshak, H.W.Newson, Phys. Rev. 106, 110 (1957).

Cr^{50} 24 26

Reaction γ $Cr^{50}(n,n'\gamma)$ $E_n = 4.4$

0.787 10 scin

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

Cr^{51} 24 27 28^d

τ **27.8^d** 1 $Cr^{(50)}$(pile n,γ) chem

56S87 R.P.Schuman, M.E.Jones, A.C.Newherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

τ **27.9^d** 2 Cr($\leq$15-Mev d) chem

56K33 P.Kafalas, J.W.Irvine, Jr., Phys. Rev. 104, 703 (1956).

Cr^{51} 24 27 28^d

$\gamma(V^{51})$

~0.01†	~**0.32**	scin $\gamma\gamma$
100†	**0.325**	scin

(~0.32γ)(0.325γ)

56O12 S.Ofer, R.Wiesser, S.Cohen, Bull. Research Council Israel 6A, 152A (1956).

Cr^{52} 24 28

Levels $Cr^{(52)}(n,n')$ $E_n = 4.4$ ppl 90°

σ(mb/sr)	Level
14 5	**(1.45)**
5 2.5	**(2.43)**
14 7	**(3.13)**

56W36 J.B.Weddell, Phys. Rev. 104, 1069 (1956); Bull. Am. Phys. Soc. 1, No. 1, 55 R5 (1956).

Reaction γ's $Cr^{52}(n,n'\gamma)$ $E_n = 4.4$

4†	**0.960** 20	scin
64†	**1.455** 10	

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

Cr^{53} 24 29

Ground state enriched Cr^{53}

J **3/2** para

56M98 A.A.Manenkov, A.M.Prokhorov, Zhur. Eksptl.' i Teoret. Fiz. 31, 346 (1956); Soviet Phys. JETP 4, 288 (1957).

Resonances $Cr^{(52)}(n)$ E_n = 1 to 410 kev

E_o(kev)	Γ(kev)	E_o(kev)	Γ(kev)
51	1.2		
97.5	3.0	**152**	1.0
120.4	0.6	**243**	1.5
138	1.0	**325**	2.5
142	1.2	**366**	2.5
146	0.9	**406**	4.5

56H60 C.T.Hibdon, Bull. Am. Phys. Soc. 1, No. 7, 347 X6 (1956); verbal report.

Cr^{54} 24 30

Capture γ's $Cr^{(53)}$(th n,γ) (Excitation = 9.72 Mev)

(8.88γ)(0.84γ)(θ) J = 1(D), 2(Q), 0 or 1(D), 1(D), 0

Levels $Cr^{(53)}$(polarized th n,γ)

(0.84) $J = 2^+$

(9.72)* $J = 1^-$

From circular polarization of 8.88 and 9.72 capture γ's

*Neutron capture state

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956).

$Cr^{56}_{24\ 32}$ τ $<1.3^h$ or $>210^y$ Cr,Ni,Cu(350-Mev p) chem

56J32 J.W.Jones, NYO-6627 (1956).

τ $\geq 270^y$ $x\sigma_{barns}[Cr^{55}(n,\gamma)]$ $Cr^{(54)}$(pile n) chem
No $2.6^h Mn^{56}$ activity found

57R48 L.P.Roy, L.Yaffe, Can. J. Chem. 35, 176 (1957).

Mn 25 Relative isotopic abundances ms
No Mn^{51}, Mn^{52}, Mn^{56}, Mn^{58}, Mn^{59}, Mn^{60} (<0.01%)

56K32 L.Kerwin, Can. J. Phys. 34, 1080 (1956).

$Mn^{52}_{25\ 27}$ 5.7^d s.s.
τ 5.69^d 3 $Cr^{(52)}$ ($\leq$15-Mev d,2n)chem

56K33 P.Kafalas, J.W.Irvine,Jr., Phys. Rev. 104, 703 (1956).

τ 5.82^d 6 Mn^{55}(170-Mev p) chem

56R45 G.Rudstam, Thesis Univ. Uppsala (1956).

$(0.73\gamma)(\theta,T;\uparrow\rightarrow)$
$(0.94\gamma)(\theta,T;\uparrow\rightarrow)$
$(1.45\gamma)(\theta,T;\uparrow\rightarrow)$
$J = 6^+, 4^+, 2^+, 0^+$ for 3.13, 2.43, 1.45, and 0 levels in Cr^{52}

5.7^d ground state
μ $+2.8^{+8}_{-5}$
Measured anisotropy and circular polarization of γ's from oriented nuclei

57H80 W.J.Huiskamp, A.N.Diddens, J.C. Severiens, A.R.Miedema, M.J.Steenland, Physica 23, 605 (1957); 22, 587 (1956).

$Mn^{53}_{25\ 28}$ $>10^{5y}$
τ $>1.3 \times 10^{5y}$ Cr^{52}(10-Mev d)
K x ray and 0.840γ which were detected are attributable to $291^d Mn^{54}$

57H88 J.R.Huizenga, J.Wing, ANL-5738 (1957).

$Mn^{53}_{25\ 28}$
$>10^{5y}$ ground state Cr(18-Mev d) chem
J 7/2 para
$|\mu|$ 5.050 7
$|\mu(Mn^{53})/\mu(Mn^{55})| = 1.455$ 2

56D45 W.Dobrowolski, R.V.Jones, C.D.Jeffries, Phys. Rev. 104, 1378 (1956).

$Mn^{54}_{25\ 29}$ 291^d e.s.
τ 278^d 5 $Fe^{(54)}$(pile n,p) chem

56S87 R.P.Schuman, M.E.Jones, A.C.Newherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

τ 290^d 6 Cr($\leq$15-Mev d) chem

56K33 P.Kafalas, J.W.Irvine, Jr., Phys. Rev. 104, 703 (1956).

τ 300^{d*} 7 $Cr^{(54)}$(p,n) chem
Decay followed for 1.4 half-lives ic γ
*Tentative value

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$Mn^{54}_{25\ 29}$ 2.1^m activity not found from Mn^{55}($\leq$25-Mev γ,n) GM, scin

57M38 K.G.McNeill, J.D.Prentice, L.Katz, W.Link, Can. J. Phys. 35, 753 (1957).

$Mn^{55}_{25\ 30}$ Level $Mn^{55}(p,p')$ E_p = 4.8 to 5.5
0.128 7 sπ 180°

56W30 P.M.Windham, C.R.Gossett, G.C.Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Reaction γ $Mn^{55}(p,p'\gamma)$ E_p = 1.75
0.128 1 $\epsilon B(E2) = 0.0009$ 2 sd ce_K

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ $Mn^{55}(\alpha,\alpha'\gamma)$ E_α = 1.0 to 3.5
$Mn^{55}(p,p'\gamma)$ E_p = 0.75
0.128 $\epsilon B(E2) = 0.075$ scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 93, 351; 96, 426 (1954).

Reaction γ's $Mn^{55}(N^{14},N^{14}'\gamma)$ E_{N14} = 15.6
0.127 2 scin
0.590 10

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

Mn^{56} 25 31 2.6^h — $\gamma(Fe^{56})$

100†	0.845			scin
29†	1.8	0.67†	2.69	
15†	2.1	0.35†	2.93	
1.02†	2.56	0.2†	3.2	

57S48 C.S.Cook, F.M.Tomnovec, Bull. Am. Phys. Soc. 2, 24 G3 (1957); verbal report.

Mn^{56} 25 31 — Resonances $Mn^{55}(n)$ E_n = 1.6 to 100.5 kev, (Excitation ≥ 7.26 Mev) Li(p,n)

σ	E_o(kev)	J	Γ(kev)
150 *6*	2.36 *25*		
73 *3*	7.30 *25*		
73 *3*	9.00 *25*		
24 *1*	21.20 *25*		
20 *1*	27.3 *3*		
43.0 *15*	35.1 *4*	3	2.8

D_o 10 kev E_n = 0 to 25 kev

Γ_n^o/D 3.3×10^{-4} *5*

if σ_s(potential) = $4\pi R^2$; $R = 1.45A^{1/3}$

57M10 H.Marshak, H.W.Newson, Phys. Rev. 106, 100 (1957).

Fe 26 — Capture γ's — Fe(th n,γ) — s77 Cp

3.2†	0.313 *6*	1.1†	3.725* *25*	
6.7†	0.364* *8*	2.3†	3.844 *15*	
4.1†	0.454 *10*	1.4†	4.034 *20*	
1.5†	1.236* *12*	4.3†	4.220* *15*	
1.9†	1.530* *15*	2.2†	4.405* *15*	
6.1†	1.626* *12*	2.1†	4.805* *15*	
6.4†	1.720* *10*	0.9†	4.940 *20*	
2.3†	1.802 *15*	0.6†	5.510* *25*	
1.4†	2.143* *10*	8.7†	5.925* *25*	
1†	2.672 *20*	7.9†	6.026* *15*	
2.9†	2.730 *15*	0.7†	6.430* *25*	
2.1†	2.837* *15*	5.3†	7.275* *15*	
2.1†	3.146 *25*	31.5†	7.636* *10*	
2.9†	3.240* *15*	0.2†	8.342 *60*	
3.9†	3.430* *15*	0.3†	8.86$ *6*	
1.4†	3.552* *20*	2.7†	9.295$ *15*	

Study covered E_γ = 0.25 to 11

†Photons/100 Fe captures (σ_a = 2.43)

(Max in Fe^{55},Fe^{57},Fe^{58},Fe^{59} = 5†, 93†, 2†, ~0.1†)

*Assigned to Fe^{57}

$Assigned to Fe^{55}. 9.295γ may also be in Fe^{58}

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

Fe(n,p; n,pn) E_n = 13.2; ppl

Preferred emission of protons in forward direction for all E_p noted.

Graphs of $\sigma(E_p)$ and $\sigma(\theta)$ given. σ = 0.15 *3*

57B127 G.Brown, G.C.Morrison, H.Muirhead, W.T.Morton, Phil. Mag. 2, 785 (1957).

Fe^{54} 26 28 — Level — $Fe^{54}(p,p')$ — E_p = 4.63

1.413 *5* — s77 180°

56W30 P.M.Windham, C.R.Gossett, G.C.Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Fe^{55} 26 29 2.9^y — τ — 2.60^y *2* — Fe^{54}(pile n,γ)

56S87 R.P.Schuman, M.E.Jones, A.C.Mewherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

E_{dis} 0.222 *10* scin γ-continuum

(γ continuum)/ϵ_K = 4×10^{-5} *1*

57M64 A.Michalowicz, Ann. Phys. 2, 116 (1957); J. phys. radium 14, 214 (1953).

Fe^{55} 26 29 — Levels — $Mn^{55}(p,n)$ — E_p = 1.5 to 5.5

	0.924 *10*	thresh n ~0°
	1.327 *15*	2.92 *4*
	2.17 *3*	3.34?
	2.554 *15*	3.76 *4*

g.s. Q = −1.015 used No 1.84 level

57C30 R.A.Chapman, J.C.Slattery, Phys. Rev. 105, 633 (1957); Bull. Am. Phys. Soc. 1, No. 2, 95 N3 (1956).

Fe^{56} 26 30 — Levels — $Co^{59}(p,\alpha)$ — E_p = 6.51, 6.77

g.s.	Q = +3.242 *8*	s 50°, 90°
0.844 *11*		2.964 *14*
2.085 *13*		3.127 *14*
2.661 *14*		3.379 *14*

2.940 and 3.388 levels were not observed

57M03 M.Mazari, A.Sperduto, W.W.Buechner, Phys. Rev. 107, 365 (1957); Bull. Am. Phys. Soc. 2, No. 4, 179 D12 (1957)

Level — $Fe^{56}(\alpha,\alpha'\gamma)$ — E_α = 4.0 to 6.5

0.850 *9* $\tau = 6.0^{\mu\mu s}$ *9* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Level — $Fe^{(56)}(\gamma,\gamma)$ — Mn^{56} source

(0.85) $\tau > 5.5^{\mu\mu s}$

β recoil of $2.6^h Mn^{56}$ source in liquid state utilized to compensate for γ recoil

54I02 K.Ilakovac, Proc. Phys. Soc. 67A, 601 (1954).

Level — $Fe^{56}(p,p')$ — E_p = 4.5 to 5.7

0.845 *5* s77 180°

56W30 P.M.Windham, C.R.Gossett, G.C. Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Level — $Fe^{(56)}(n,n'\gamma)$

(0.85) (scin n')(scin γ)

E_n	1.50	1.58	1.66
$\sigma(n',30°)/\sigma(n',150°)$	0.72	1.12	1.10 ± 0.10

57N04 V.Naggiar, G.C.Phillips, M.Roclawski-Conjeaud, D.Szteinsznaider, Compt. rend. 245, 668 (1957).

$Fe^{56}_{26\ 30}$

Levels $Fe^{(56)}(n,n')$ $E_n = 4.4$

$\sigma(90°)$	Level	$\sigma(90°)$	Level
17.5 44	(0.85)		ppl 90°
7.6 27	(2.09)	<2.2	(3.02)
5.5 22	(2.60)	4.4 22	(3.26)
	(2.87)		

σ units: mb/sterad

Reaction γ's $Fe^{(56)}(n,n'\gamma)$ $E_n = 14$ scin

σ	E_γ
0.75 8	0.85
0.26 3	1.25
	1.82
	2.12

55M99 G.W.McClure, D.W.Kent, J.Franklin Inst. 260, 238 (1955).

$Fe^{57}_{26\ 31}$

Level $Fe^{(56)}$(polarized th n,γ)
Circular polarization of 7.64 capture γ shows $J = 1/2^-$ for final level (g.s. or 0.014)

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956); Nature 176, 507 (1955).

Reaction γ's $Fe^{57}(p,p'\gamma)$ $E_p = 1.75$ sd ce_K

0.137 level

0.122 1	$\epsilon B(E2) = 0.0007$ 4
0.137 1	$= 0.0004$ 2

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ $Fe^{57}(\alpha,\alpha'\gamma)$ $E_\alpha = 1.0$ to 3.5 scin γ

0.137 level

0.122	$\epsilon B(E2) = 0.057$

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 93, 351; 96, 426 (1954).

Reaction γ's $Fe^{57}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.0$

0.137 level $\epsilon B(E2) = 0.050$

91†	0.123	scin γ
9†	0.137	

0.365 level $\epsilon B(E2) = 0.035$

	0.123
7†	0.228
93†	0.350

(0.228 γ)(0.123γ) No 0.365γ (<5†)

57H38 N.P.Heydenburg, G.F.Pieper, Bull. Am. Phys. Soc. 2, No. 1, 61 U10 (1957); verbal report.

$Fe^{57}_{26\ 31}$

Capture γ's $Fe^{(56)}$(th n,γ) 877 Cp

6.7†	0.364 8	1.1†	3.725 25
1.5†	1.236 12	4.3†	4.220 15
1.9†	1.530 15	2.2†	4.405 15
6.1†	1.626 12	2.1†	4.805 15
6.4†	1.720 10	0.6†	5.510 25
1.4†	2.143 10	8.7†	5.925 25
2.1†	2.837 15	7.9†	6.026 15
2.9†	3.240 15	0.7†	6.430 25
3.9†	3.430 15	5.3†	7.275 15
1.4†	3.552 20	31.5†	7.636 10

Study covered $E_\gamma = 0.25$ to 11

†Photons/100 Fe captures ($\sigma_a = 2.43$)
(Max in Fe^{55},Fe^{57},Fe^{58},Fe^{59} = 5†,93†,2†,~0.1†)
Isotopic assignments from intensities and energetics

56A37 B.P.Adyasevich, L.V.Groshev, A.M. Demidov, J. Nuclear Energy 3, 258 (1956); Soviet J. Atomic Energy No. 2, 40 (1956).

Resonances $Fe^{(56)}(n)$ $E_n = 1$ to 410 kev

E_0(kev)	Γ(kev)	E_0(kev)	Γ(kev)
29.17	1.0	188	0.95
75.6	0.9	219	0.55
85.5	1.0	272	2.2
127.7	0.6	316	3.5
138	0.825	360	4
145	0.8	388	8
162	0.875	406	5

56H60 C.T.Hibdon, Bull. Am. Phys. Soc. 1, No. 7, 347 X6 (1956); verbal report.

$Fe^{59}_{26\ 33}$ 45^d

τ 44.3^d 4 $Fe^{(58)}(n,\gamma)$ chem
Decay followed for 5.4 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

τ 45.0^d 2 differential ic

55T27 J.Tobailem, Ann. phys. 10, 783 (1955); Compt. rend. 233, 1360 (1951).

τ 47.1^d 3 As^{75}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

$\beta\gamma$ and $\gamma\gamma$ delay < $100^{\mu\mu s}$ scin

55B148 E.E.Berlovich, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 343 (1955); Columbia Tech. Transl. p.305.

Fe^{60} 26 34 $\sim 3\times10^{5y}$

τ $\sim 3\times10^{5y}$ Cu(400-Mev p) chem

p 10^mCo chem. Counts greatly reduced by 8 mg/cm^2 of Al absorber. GM

Estimated half-life assuming (yield Fe^{60})/(yield 45^dFe^{59}) = 0.3

57R54 J.C.Roy, T.P.Kohman, Can. J. Phys. 35, 649 (1957).

Fe^{60} 26 34

τ $<7^m$ or $>300^{y*}$ Ni(350-Mev p) chem; $Fe^{(58)}$(pile 2n,γ) chem

*If $\sigma[Fe^{59}(n,\gamma)] = 1$

56J32 J.W.Jones, NYO-6627 (1956).

Co^{56} 27 29 77^d

τ 77.3^d *3* $Fe^{(56)}$(p,n) chem

Decay followed for 3 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

β^+ ~ 0.44 sl

~ 1.50

No 0.98β^+

($E_\beta > 0.500$)(0.845, 1.24γ) scin

(0.845γ)(1.24γ)(θ) with $E_\beta > 0.60$ scin $\beta^+\gamma\gamma$

J = 4, 2, 0 $A_2 = +0.1023$ *27* $A_4 = +0.0015$ *35*

57B55 G.Bertolini, E.Lazzarini, M.M.Bettoni, Nuovo Cim. 5, 356 (1957).

$\gamma(Fe^{56})$ $Fe^{(56)}$(p,n) chem scin

100†	**0.845**		
~2†	**0.975**	11.5†	**2.02**
16†	**1.025**	16†	**2.56**
70†	**1.22**	2†	**2.98**
6†	**1.35**	11.6†	**3.25**
17†	**1.76**	1.1†	**3.47**

0.845γ/β^+ = 5.3 2 scin $\gamma/\gamma^\pm$

No 1.5γ (< 1†)

56S107 C.S.Cook, F.M.Tomnovec, Phys. Rev. 104, 1407 (1956); Bull. Am. Phys. Soc. 1, No. 1, 31 H8 (1956); 1, No. 5, 253 F7 (1956).

$\beta^+(1.24\gamma)$ delay $\leq 20^{\mu\mu s}$ scin

Resolving time = $832^{\mu\mu s}$; self comparison

(1.24γ)(0.84γ) delay $\leq 10^{\mu\mu s}$

Resolving time = $996^{\mu\mu s}$; Sc^{46} comparison

56B145 G.Bertolini, Nuclear Phys. 2, 660 (1956).

Co^{57} 27 30 270^d

$Fe^{(56)}$(d,n) chem; sd

$\epsilon_L/\epsilon_K = 0.20$ *13* from $e_{AK}/(ce_K\ 0.014\gamma) = 1.48$ *10*

56M85 A.Moussa, A.Juillard, Compt. rend. 243, 1515 (1956).

Co^{57} 27 30 270^d

$Fe^{(56)}$(d,n) chem

$\gamma(Fe^{57})$		K/LM	L/M	
43 2*	**0.01437** *1*	8.05 *13*	9.1 *5*	
1 *	**0.12194** *3*	6.7 *6*		sd ce
0.85 *4**	**0.13631** *3*	8.2 *5*		

*Relative ce_K intensities

57B45 J.B.Bellicard, A.Moussa, J. phys. radium 18, 115 (1957); Compt. rend. 241, 1202 (1955).

$Fe^{(56)}$(7-Mev d,n) chem

$\gamma(Fe^{57})$ **(0.014)** $\delta = +0.14$ $\gamma\gamma(\theta)$

E2/M1 = 0.020

(0.123) ($\delta = -0.19$)*

(0.123γ)(0.014γ)(θ) J = 5/2, 3/2, 1/2

$A_2 = -0.024$ *3* $A_4 \sim 0$ liquid source

*From nuclear alignment data of Bishop et al., Phil. Mag. 46, 95 (1955).

56L45 T.Lindqvist, E.Heer, Nuclear Phys. 2, 680 (1956).

Co^{58} 27 31 71^d g.s.

τ 71.3^d 2 $Ni^{(58)}$(pile n,p) chem

56S87 R.P.Schuman, M.E.Jones, A.C.Mewherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

$\gamma(Fe^{58})$ $Ni^{(58)}$(n,p) chem scin

100†	**(0.805)**		
0.5†	**1.67**		

0.805γ/β^+ = 6.9 2 scin $\gamma/\gamma^\pm$

No 0.865γ (< 2†)

56S107 C.S.Cook, F.M.Tomnovec, Phys. Rev. 104, 1407 (1956); Bull. Am. Phys. Soc. 1, No. 5, 253 F7 (1956).

$\gamma(Fe^{58})$ **(0.805)** E2 $\gamma(\theta,T)$

(1.60) E2

$\lambda = 0.11$ *4* for Co^{58} decay to Fe^{58} 0.805 level

$\lambda = 0.45$ *11* for Co^{58} decay to Fe^{58} 1.60 level

where $1/\lambda = 1 + \dfrac{(C_T^2 + C_A^2)\,|\int\sigma|^2}{(C_S^2 + C_V^2)\,|\int 1|^2}$

56G52 D.F.Griffing, J.C.Wheatley, Phys. Rev. 104, 389 (1956).

polarized Co^{58}

$\beta^+(\theta) = 1 + (0.23\ 6)\langle J_z/J\rangle\langle v/c\rangle\cos\theta$

scin $(\gamma^\pm)(\gamma^\pm)$

57P35 H.Postma, W.J.Huiskamp, A.R.Miedema, M.J.Steenland, H.A.Tolhoek, C.J.Gorter, Physica 23, 259 (1957).

Co^{58}
27 31
71^d
g.s.

polarized Co^{58}

$\beta^+(\theta) = 1 + (\sim 0.3)\langle J_z/J\rangle (v/c)\cos\theta$ ($J = 2^+$ to 2^+)
β asymmetry vs. v/c given in graph

57A50 E.Ambler, R.W.Hayward, D.D.Hoppes, R.P.Hudson, C.S.Wu, Phys. Rev. 106, 1361 (1957).

β^+(right circular $\gamma)(\theta) = 1 - (0.14\ 7)\langle v/c\rangle\cos\theta$
γ ray shown to be circularly polarized by scattering from magnetized iron

57B94 F.Boehm, A.H.Wapstra, Phys. Rev. 107, 1462 (1957).

Co^{59}
27 32

Levels $Co^{59}(n,n')$ $E_n = 4.4$

$\sigma(90°)$	Level	
50 *10*	g.s.	ppl 90°
19 *6*	(1.10)	
	(1.29)	σ units: mb/sterad

56W31 J.B.Weddell, Bull. Am. Phys. Soc. 1, No. 7, 339 P8 (1956); verbal report.

Levels $Co^{59}(p,p')$ $E_p = 6.51, 6.77$

		s 50°, 90°	
1.097 5	2.183 5		
1.189* 5	2.205 5	2.911$ 6	3.222 8
1.289 5	2.397 6	2.955 6	3.233 8
1.432 5	2.477 6	2.964 9	3.273 8
1.458 5	2.540 6	3.015 6	3.323 8
1.479 8	2.585 6	3.058 6	3.379 8
1.743 5	2.711 6	3.081$ 9	3.412$ 8
2.061 5	2.770 6	3.120 10	3.490 8
2.086 5	2.781 6	3.148 10	3.560 10
2.152 5	2.822 6	3.159 8	3.602 8
		3.192 8	3.654 10

*Strongest $Double?

57N03 M.Nazari, A.Sperduto, W.W.Buechner, Phys. Rev. 107, 365 (1957); Bull. Am. Phys. Soc. 2, No. 4, D12 (1957).

Co^{60}
27 33
5.2^y
g.s.

τ 5.24^y 3 Co^{59}(pile n,γ)
Decay followed for 1.3 half-lives ic γ

57G07 K.W.Geiger, Phys. Rev. 105, 1539 (1957).

No 2.18γ ($< 10^{-2}$%) $Be^9(\gamma,n)$
No 2.51γ ($< 4 \times 10^{-3}$%) $D(\gamma,n)$

56D48 B.S.Dzhelepov, I.A.Iaritsyna, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 343 (1956); Columbia Tech. Transl. p.314.

No 2.51γ ($< 10^{-4}$%) $D(\gamma,n)$

56E15 R.D.Edge, Australian J. Phys. 9, 429 (1956).

Co^{60}
27 33
5.2^y
g.s.

β^- longitudinal polarization ($J = 5^+$ to 4^+)
-0.49 *11* $E_\beta = 0.168$ ($v/c = 0.66$)
More spins antiparallel to direction of motion
Measured scattering of β's by gold foil after deflection by electric field

57D21 H. de Waard, O.J.Poppema, Physica 23, 597 (1957).

β^- longitudinal polarization ($J = 5^+$ to 4^+)
-0.65 *13* $E_\beta = 0.128$ ($v/c = 0.6$)
More spins antiparallel to direction of motion
Measured scattering of β's by gold foil after passage through spin rotator

57C06 P.E.Cavanagh, J.F.Turner, C.F.Coleman, G.A.Gard, B.W.Ridley, Phil. Mag. 2, 1105 (1957).

$\beta(\theta) \sim 1 - 0.7(\langle J_z/J\rangle)\cos\theta$ polarized Co^{60}
Parity not conserved in β decay

57E38 C.S.Wu, E.Ambler, R.W.Hayward, D.D. Hoppes, R.P.Hudson, Phys. Rev. 105, 1413 (1957).

polarized Co^{60}
$\beta^-(\theta) = 1 - (\sim 0.9)\langle J_z/J\rangle (v/c)\cos\theta$ ($J = 5^+$ to 4^+)
β asymmetry vs. v/c given in graph

57A58 E.Ambler, R.W.Hayward, D.D.Hoppes, R.P.Hudson, C.S.Wu, Phys. Rev. 106, 1361 (1957).

β(right circular $\gamma)(\theta) = 1 - (0.41\ 7)\langle v/c\rangle\cos\theta$
γ ray shown to be circularly polarized

57B21 H.Schopper, Phil. Mag. 2, 710 (1957).

β^-(right circular $\gamma)(\theta) = 1 - (0.40\ 9)\langle v/c\rangle\cos\theta$
γ ray shown to be circularly polarized by scattering from magnetized iron

57B93 F.Boehm, A.H.Wapstra, Phys. Rev. 106, 1364 (1957).

β^-(right circular $\gamma)(\theta) = 1 - (0.35\ 5)\langle v/c\rangle\cos\theta$
γ ray shown to be circularly polarized by forward scattering from magnetized iron

57A59 H.Appel, H.Schopper, Z.Physik 149, 103 (1957).

(1.17γ)(1.33γ)($\angle$) $J = 4^+, 2^+, 0^+$ scin

56E16 I.V.Estulin, V.S.Popov, F.E.Chukreev, Zhur. Eksptl.' i Teoret. Fiz. 30, 1052 (1956); Soviet Phys. JETP 3, 866 (1956).

Co^{60} 27 33

Capture γ's Co^{59}(th n,γ) scin

(Excitation = 7.49 Mev)

23 4†	0.226 4	
23 4†	0.276 4	

Study covered E_γ = 0.05 to 0.50

†Photons/100 Co^{59} captures (σ_a = 35.4)

57E28 I.V.Estulin, L.F.Kalinkin, A.S. Melioransky, Nuclear Phys. 4, 91 (1957); Zhur. Eksptl. i Teoret. Fiz. 31, 886 (1955); Soviet Phys. JETP 4, 752 (1957).

Resonance Co^{59}(n,γ) pulsed n's

(Excitation = 7.49 Mev)

(0.134 ev) σ_o = 10,000

If J = 4 σ_o = 10,600; if J = 3 σ_o = 8200

56L42 J.E.Lynn, E.R.Rae, quoted by V.L. Sailor, Phys. Rev. 104, 736 (1956); E.R.Rae, Proc. 1954 Glasgow Conf. on Nuclear and Meson Phys. Pergamon Press, London and New York (1955) p.71.

Resonances Co^{59}(n) E_n = 1.6 to 100.5 kev, (Excitation ≥ 7.49Mev) Li(p,n)

σ	E_o(kev)
120 5	4.70 25
18.0 5	7.80 25
24 1	28.3 3

$\frac{D}{\Gamma_n^o/D}$ 8.5 kev; 1.9 x 10^{-4} 6 E_n = 0 to 25 kev

if σ_s (potential) = $4\pi R^2$; $R = 1.45A^{1/3}$

57M10 H.Marshak, H.W.Newson, Phys. Rev. 106, 110 (1957).

Ni 28

Levels Ni(n,n') E_n = 4.4

σ(90°)	Level	σ(90°)	Level	
32 5	g.s.	4 1.5	(2.18)	ppl 90°
11 3	{(1.33) (1.45)}	5 2.5	{(2.48) (2.51)}	

σ units: mb/sterad

56W31 J.B.Weddell, Bull. Am. Phys. Soc. 1, No. 7, 339 P8 (1956); verbal report.

Capture γ's Ni(n,γ) E_n = th; sπ Cp

≥3.5†	0.280 15	≥1.6†	5.312 30
≥6†	0.467 8	≥1.3†	5.725 30
≥2†	1.10?	2.6†	5.842 25
≥1†	1.53?	1.3†	6.030 30
≥1†	3.03?	1.0†	6.315 30
≥1†	3.17?	2.8†	6.639 30
≥1†	3.67?	5.1†	7.575 30
≥1†	4.05?	6†	7.825 20
≥0.7†	4.20?	2.5†	8.095 30

10 other γ's assigned to Ni^{59}, q.v.

†Photons/100 Ni captures (max. in Ni^{59} 71†, Ni^{61} 15†, Ni^{62} 0.6†, Ni^{63} 13†, Ni^{65} 0.5†)

56A49 V.P.Adyasevich, L.V.Groshev, A.M. Demidov, B.N.Lutsenko, Atom. Energiya No. 2, 28 (1956); J. Nuclear Energy 3, 325 (1956).

Ni^{57} 28 29 36^h

Fe(54)(56-Mev α,n) chem

Ni(28-Mev d) chem

β^+	~2†	0.35 5		sl
	22†	0.72 3		
	76†	0.854 9		
$\gamma(Co^{57})$	60†	0.1272 5	α_K = 0.022 6 K/LM = 9 4	scin, sl ce
	11†	0.400 20		scin
	176†	1.363 6		
	28†	1.89 2		

$\gamma^\pm$(0.1272, 1.363, 1.89γ)

(0.1272 $\gamma\gamma$)(1.363 $\gamma\gamma(\theta)$ favors J = 1/2, 3/2, 7/2 with E2/M1(0.1272γ) = 0.0025 25

ϵ/β^+ = 1.0 1 from $\gamma/\gamma^\pm$

1.5 3 from branching to Co^{57} levels deduced from γ intensities and theoretical ϵ/β^+ of Feenberg-Trigg

No 1.49γ (< 0.6^+)

No (1.89 $\gamma\gamma$)(0.1272, 1.363$\gamma\gamma$)

56K28 J.Konijn, B.Van Nooijen, P.Mostert, P.M.Endt, Physica 22, 887 (1956).

Ni^{58} 28 30

Level Ni^{58}(p,p') E_p = 4.4 to 5.5 sπ 180°

1.453 5

56W30 P.M.Windham, C.R.Gossett, G.C. Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Levels Ni^{58}(p,p') E_p = 6.0, 7.0 s 30°, 90°, 130°

1.452 6		
2.458 6		
2.772 6	3.528 10	
2.899 6	3.592 10	
2.939 6	3.630 10	
3.035 6	3.774 10	
3.260 6	3.898 10	
3.418 6	4.106 10	

57P01 C.H.Paris, W.W.Buechner, Bull. Am. Phys. Soc. 2, No. 1, 61 U11 (1957); verbal report.

Levels Ni^{58}(p,p') E_p = 5.31 sπ

2.456 7	2.905 4	
2.491 7	2.945 5	
2.779 4	3.041 4	

57S91 R.R.Spencer, Bull. Am. Phys. Soc. 2, No. 2, 105 J9 (1957).

Level $Ni^{(58)}$(polarized th n,γ)

g.s. J = 3/2⁻

From circular polarization of 9.00 capture γ

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956).

Ni^{59} 28 31

Levels $Co^{59}(p,n)$ E_p = 1.8 to 5.3

g.s.	Q = -1.856 4	thresh n, ~0°
0.341 4		
0.439 5	2.15? 1	
1.22 1	2.545 10	
1.343 10	2.72? 2	
1.79 1	3.054 10	
1.964 10	3.19 2	

Data agree with those of Chapman and Slattery but interpretation differs

57B137 J.W.Butler, K.L.Dunning, R.O.Bondelid, Phys. Rev. 106, 1224 (1957); Bull. Am. Phys. Soc. 1, No. 7, 327 G7 (1957).

Levels $Co^{59}(p,n)$ E_p = 1.8 to 5.7

g.s.	Q = -1.863 5	thresh n, ~0°
0.325 15		
1.195 10	3.043 10	
1.776 10	3.340?15	
2.551 15	3.543?15	

Data agree with those of Butler et al. but interpretation differs

57C30 R.A.Chapman, J.C.Slattery, Phys. Rev. 105, 633 (1957).

Capture γ's $Ni^{(58)}(n,\gamma)$ E_n = th; sπ Cp

(Excitation = 9.00 Mev)

≥7†	0.330 15	10.8†	6.842 20
≥3†	0.436 15	0.6†	7.015 50
≥1†	1.74?	0.7†	7.19 5
≥2†	2.15?	12.3†	8.505 30
1.6†	6.135 25	28†	8.996 10

†Photons/100 Ni captures See also Ni

56A49 V.P.Adyasevich, L.V.Groshev, A.M. Demidov, B.N.Lutsenko, Atom. Energiya 1, No. 2, 28 (1956); J.Nuclear Energy 3, 325 (1956).

Ni^{60} 28 32

Level $Ni^{60}(p,p')$ E_p = 4.4 to 5.5

1.329 5 sπ 180°

56W30 P.M.Windham, C.R.Gossett, G.C.Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Levels $Ni^{60}(p,p')$ E_p = 6.0, 7.0

1.333 6	s 30°, 90°, 130°
2.159 6	3.587 10
2.285 6	3.618 10
2.504 6	3.670 10
2.624 6	3.732 10
3.120 6	3.869 10
3.184 6	3.886 10
3.191 6	3.925 10
3.268 6	4.005 10
3.316 6	4.038 10
3.391 6	4.076 10

57P01 C.H.Paris, W.W.Buechner, Bull. Am. Phys. Soc. 2, No. 1, 61 U11 (1957); verbal report.

Ni^{60} 28 32

Levels $Ni^{60}(p,p')$ E_p = 5.31

2.161 5 sπ

2.286 4

2.628 6

57S91 R.R.Spencer, G.C.Phillips, T.E.Young, Bull. Am. Phys. Soc. 2, No. 2, 105 J9 (1957).

Ni^{61} 28 33

Reaction γ's $Ni^{61}(\alpha,\alpha'\gamma)$ E_α = 4.4; scin γ

0.070 1	ε8(E2) = 0.00038 8	
0.282 3	= 0.00090 18	
0.657 7	= 0.0094 19	

No $\gamma\gamma$

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

Ni^{62} 28 34

Levels $Ni^{62}(p,p')$ E_p = 5.31

1.171 4 sπ

2.047 4

2.304 5

57S91 R.R.Spencer, G.C.Phillips, T.E.Young, Bull. Am. Phys. Soc. 2, No. 2, 105 J9 (1957).

Ni^{63} 28 35 125^y

Ni^{62}(pile n,γ) chem

τ 125^y 6 specific activity

56M95 C.C.McMullen, B.D.Pate, R.H.Tomlinson, L.Yaffe, Can. J. Chem. 34, 1742 (1956).

$Cu^{(63)}$(pile n,p) chem

β^- 0.0670 5 pc

F-K linear (E_β > 0.0075)

57P48 I.L.Preiss, R.W.Fink, B.L.Robinson, J. Inorg. Nuclear Chem. 4, 233 (1957).

Ni^{65} 28 37 2.6^h

$Ni^{(64)}$(pile n,γ)

β^-	23%	(0.63)
	8%	(0.99)
	69%	(2.08)

(scin 1.45γ)/(4π ic β)

$\gamma(Cu^{65})$ scin

27†	0.36 2	
72†	1.09 5	
100†	1.45 7	

56H84 R.L.Heath, IDO-16291 p.41 (1956).

Cu^{59} 29 30

Resonances $Ni^{58}(p,p'\gamma)$ scin 1.45γ

(6.35 ≤ Excitation ≤ 7.83)

J	No. of resonances	
$5/2^+$	19	p,$\gamma(\theta)$
3/2	17	
1/2	1	
unassigned	~33	

$\langle\theta_p^2,\rangle_{av}$ ~0.9 x 10^{-3}

D >35 kev, <80 kev

Values of θ_p^2, have ~ exponential distribution

D roughly constant

56S109 J.P.Schiffer, M.S.Moore, C.M.Class, Phys. Rev. 104, 1661 (1956).

$Cu^{61}_{29\ 32}$ 3.3^h ground state Co^{59}(40-Mev α,2n)

J 3/2 M

57N09 W.A.Nierenberg, H.A.Shugart, H.B. Silsbee, Bull. Am. Phys. Soc. 2, No. 4, 200 KA11 (1957).

$Cu^{63}_{29\ 34}$ Ground state q res

μ +2.226 *7* Zeeman splitting

57C48 H.L.Cox, Jr., D.Williams, Bull. Am. Phys. Soc. 2, No. 1, 30 JA3 (1957).

Levels $Cu^{63}(p,p')$ E_p = 4.6,5.6

		sπ 180°
0.669 *5*		
0.961 *5*	**1.411** *5*	
1.325 *5*	**1.546** *5*	

56W30 P.M.Windham, C.R.Gossett, G.C. Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

Reaction γ's $Cu^{63}(\alpha,\alpha'\gamma)$ E_α = 6

0.690 *7*	ϵB(E2) = 0.010 *2*	scin
0.990 *10*	= 0.029 *4*	

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

$Cu^{64}_{29\ 35\ 13^h}$ τ **12.87^h** *5* $Cu^{(63)}(n,\gamma)$

Decay followed for 5 half-lives ic $\gamma^\pm$

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

τ **12.90^h** *6* As^{75}(49-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala 1956.

τ **12.80^h** *3* differential ic

55T07 J.Tobailem, J. phys. radium 16, 48 (1955); Ann. phys. 10, 783 (1955).

NRC 57-2-55 Cu^{64} 57#1

$\bar{E}_\beta$ = 0.213 *12* β calorimeter

$\bar{E}_\beta$(calculated) for 38% 0.571β^- and 19% 0.657β^+ = 0.206

57S50 N.S.Shimanskaia, Zhur. Eksptl'. i Teoret. Fiz. 31, 393 (1956); Soviet Phys. JETP 4, 355 (1957).

$Cu^{64}_{29\ 35\ 13^h}$ β^+ longitudinal polarization (J = 1^+ to 0^+)

> 0

More spins parallel to direction of motion

Measured "wings" of $\gamma^\pm\gamma^\pm(\theta)$ ($\theta \sim 180°$). $\gamma^\pm$'s are made in magnetized iron.

57H17 S.S.Hanna, R.S.Preston, Phys. Rev. 106, 1363 (1957).

β^- longitudinal polarization (J = 1^+ to 0^+)

−0.57 *7* E_β = 0.145 (v/c = 0.63)

More spins antiparallel to direction of motion

Measured scattering of β's by gold foil after deflection by electric field

57V21 M.E.Vishnevsky, V.K.Grigoriev, V.A. Ergakov, S.J.Nikitin, E.V.Pushkin, Yu. V. Trebukhovsky, Nuclear Phys. 4, 271 (1957).

$Cu^{64}_{29\ 35}$ Resonance $Cu^{63}(n)$ E_n = 1.1 to 97.2 kev, (Excitation = 7.97 Mev) Li(p,n)

E_o(kev)	Γ(kev)
57.3 *6*	0.74 *15*

Several other resonance peaks

$\frac{D}{\Gamma_n\gamma_D}$ ~7 kev E_n = 1.1 to 25 kev

1.6×10^{-4} *8*

if σ_s(potential) = $4\pi R^2$; R = $1.45A^{1/3}$

57M10 H.Marshak, H.W.Newson, Phys. Rev. 106, 110 (1957).

Resonance peaks $Cu^{(63)}(n,n'\gamma)$ E_n = 0.6 to 1.1 (Excitation ~8.8 Mev)

0.80	scin 0.66γ
0.83	**0.94**
0.88	**1.024**

57P47 J.T.Prud'homme, I.L.Morgan, Bull. Am. Phys. Soc. 2, No. 2, 104 J8 (1957).

$Cu^{65}_{29\ 36}$ Ground state q res

μ +2.376 *7* Zeeman splitting

57C48 H.L.Cox, Jr., D.Williams, Bull. Am. Phys. Soc. 2, No. 1, 30 JA3 (1957).

Levels $Cu^{65}(p,p')$ E_p ~5

	sπ 180°
0.768 *4*	
1.112 *4*	
1.622 *5*	

57Y01 T.E.Young, G.C.Phillips, R.R.Spencer, Bull. Am. Phys. Soc. 2, No. 2, 104 J6 (1957).

$Cu^{65}(p,p')$ E_p = 4.6,5.6

No level observed below 1.5 sπ 180°

56W30 P.M.Windham, C.R.Gossett, G.C. Phillips, J.P.Schiffer, Phys. Rev. 103, 1321 (1956); 99, 655A (1955).

$Cu^{65}_{29\ 36}$ Reaction γ's $Cu^{65}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$; scin

0.815 *8* $\epsilon B(E2) = 0.0087$ *13*

1.15 *1* $= 0.027$ *4*

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956).

Zn 30 Relative isotopic abundances ms

No Zn^{61} (<0.02%) No Zn^{62} (<0.04%)

No Zn^{71} (<0.01%) No Zn^{72}, Zn^{73} (<0.005%)

57K03 L.Kerwin, D.F.McElcheran, M.Cottin, Can. J. Phys. 35, 783 (1957).

Levels $Zn(p,p')$ $E_p = 3.72$, 4.66 sd 91°

Isotopic Assignment	Level
Zn^{64}	0.991 5
Zn^{66}	1.038 5
Zn^{68}	1.078 5
-	1.802 5

Assignments from agreement with known levels

57V04 D.M.Van Patter, M.A.Rothman, W.C. Porter, C.E.Mandeville, Phys. Rev. 107, 171 (1957); Bull. Am. Phys. Soc. 2, No. 1, 60 U4 (1957).

$Zn^{64}_{30\ 34}$ Level $Zn^{(64)}(p,p')$ $E_p = 3.72$, 4.66

0.991 5 sd 91°

57V04 D.M.Van Patter, M.A.Rothman, W.C. Porter, C.E.Mandeville, Phys. Rev. 107, 171 (1957); Bull. Am. Phys. Soc. 2, No. 1, 60 U4 (1957).

Level $Zn^{64}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

1.00 *1* $\tau = 2.6^{\mu\mu s}$ *4* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956).

Reaction γ's $Zn^{64}(n,n'\gamma)$ $E_n = 4.4$

0.77 *3* scin

1.00 *3*

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

$Zn^{65}_{30\ 35}$ ^{245d} τ 243.5^d *8* $Zn^{(64)}$(pile n,γ)

Decay followed for 1.9 half-lives ic γ

57G07 K.W.Geiger, Phys. Rev. 105, 1539 (1957).

τ 246.4^d 22 $Zn^{(64)}(n,\gamma)$ chem

Decay followed for 1 half-life ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$Zn^{65}_{30\ 35}$ Levels $Cu^{(65)}(p,n)$ $E_p = 2.9$

g.s. (Q=-2.13) pulsed p's

0.052*

0.101

0.196

*Some evidence, but level not strongly excited

57L03 H.H.Landon, A.J.Elwyn, G.N.Glasoe, Bull. Am. Phys. Soc. 2, No. 4, 233 X3 (1957); verbal report.

Level $Zn^{(64)}$(polarized th n,γ)

Circular polarization of 7.88 capture γ shows $J = 3/2^-$ or $5/2^-$ for final level (g.s. or 0.52)

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956); Nature 176, 507 (1955).

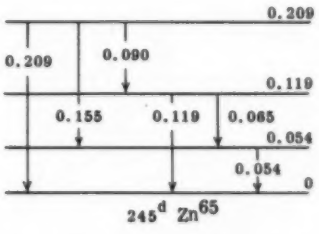
Reaction γ's $Cu^{65}(p,n\gamma)$ $E_p = 3.75$

	E_γ	K/LM	threshold s ce
1280*	0.054 2	6.1	2.223 3
60*	0.065 2	7.3	
~2*	0.090 2	-	ce_K only
60*	0.119 2	8.6	<2.38
12*	0.155 3	8.2	
2.5*	0.209 3	7.4	

Graph of excitation function for 0.119γ given from $E_p = 2.8$ to 3.9

*Relative ce intensities

Reaction γ's $Cu^{65}(p,n\gamma)$



57B44 E.M.Bernstein, H.W.Lewis, Phys. Rev. 107, 737 (1957); Bull. Am. Phys. Soc. 2, No. 1, 61 U12 (1957).

Resonances $Zn^{64}(n)$ $E_n = 0.2$ to 10 kev

(Excitation = 7.9 Mev)

$\sigma_n(10^3 b)$	E_o(kev)	Γ(ev)	
0.94	2.75	75 *8*	chopper
0.56	4.60	~60	

$\Gamma_\gamma = 0.35$ ev assumed

56D42 D.A.Dahlberg, L.M.Bollinger, Phys. Rev. 104, 1006 (1956); 95, 645A (1954).

$Zn^{66}_{30\ 36}$ Level $Zn^{(66)}(p,p')$ $E_p = 3.72$, 4.66

1.038 5 sd 91°

57V04 D.M.Van Patter, M.A.Rothman, W.C. Porter, C.E.Mandeville, Phys. Rev. 107, 171 (1957); Bull. Am. Phys. Soc. 2, No. 1, 60 U4 (1957).

Zn^{66} 30 36

Level $Zn^{(66)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$
1.04 *1* $\tau = 2.8^{\mu\mu s}$ *4* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Reaction γ's $Zn^{66}(n,n'\gamma)$ $E_n = 4.4$ scin
6† **0.836** *12*
10† **1.051** *10*

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

Zn^{67} 30 37

Ground state
q **+0.18** *2* double res

57B110 K.Böckmann, H.Krüger, E.Recknagel, Ann. Physik 20, 250 (1957); Naturwiss. 44, 7 (1957).

Level $Zn^{(67)}(\gamma,\gamma)$ $E_\gamma \leq 75$ scin
(0.092) $\tau = 9.4^{\mu s}$ *3*

57B139 A.J.Bureau, C.L.Hammer, Phys. Rev. 105, 1006 (1957).

$Zn^{(66)}$(th n,γ)
(capture γ)(0.09γ) delay = $8.5^{\mu s}$ scin

56P40 J.M.Ponce de Léon, C.Sánchez del Río, Anales real soc. espan. fis. y quim. 52A, 137 (1956).

Reaction γ's $Zn^{67}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.5$ scin γ
0.182 level
0.090 (2 unresolved γ's)
0.182 *2* ϵB(E2) = 0.032 *5*

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 96, 426; 93, 351 (1957).

Zn^{68} 30 38

Level $Zn^{(68)}(p,p')$ $E_p = 3.72, 4.66$ sd 91°
1.078 *5*

57V04 D.M.Van Patter, M.A.Rothman, W.C. Porter, C.E.Mandeville, Phys. Rev. 107, 171 (1957); Bull. Am. Phys. Soc. 2, No. 1, 60 U4 (1957).

Reaction γ's $Zn^{68}(n,n'\gamma)$ $E_n = 4.4$ scin
38† **0.821** *12*
76† **1.099** *14*

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

Zn^{68} 30 38

Resonances Zn^{67}(n) $E_n = 0.2$ to 10 kev
(Excitation = 10.2 Mev)

$\sigma_o(10^3 b)$	E_o(kev)	Γ(ev)	
4.8	**0.225**	1.9 *2*	chopper
2.8	**0.455**	13.0 *15*	
0.78	**1.62**	10 *3*	
0.56	**2.30**	43 *10*	

g = 1/2 and Γ_γ = 0.35 ev assumed

56D42 D.A.Dahlberg, L.M.Bollinger, Phys. Rev. 104, 1006 (1956); 95, 645A (1954).

Zn^{69} 30 39 58^m g.s.

τ **58.5**^{m} *12* As^{75}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

$14^h Zn^{69}$ source
β^- **0.92** *2* F-K linear sm

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955); Columbia Tech. Transl. p.294.

Zn^{69} 30 39 14^h

τ **13.9**^{h} *2* As^{75}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

$\gamma(Zn^{69})$ **0.439** *3* $\alpha_K = 0.040$ *5* sm ce
K/L = 7.5 *10* M4

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955); Columbia Tech. Transl. p.294

Zn^{69} 30 39

Resonance Zn^{68}(n) $E_n = 0.2$ to 10 kev
(Excitation = 6.5 Mev)

$\sigma_o(10^3 b)$	E_o(kev)	Γ(ev)	
4.7	**0.530**	9.9 *4*	chopper

Γ_γ = 0.35 ev assumed

56D42 D.A.Dahlberg, L.M.Bollinger, Phys. Rev. 104, 1006 (1956); 95, 645A (1954).

Ga 31

Relative isotopic abundances ms
No Ga^{66}, Ga^{67}, Ga^{68}, Ga^{73}, Ga^{74} (<0.04%)
No Ga^{70} (<0.07%) No Ga^{72} (<0.2%)

56K38 L.Kerwin, D.E.McElcheran, Can. J. Phys. 34, 1497 (1956).

Ga^{64} 31 33 2.6^m

β^+ 38† **2.81** *4* s
62† **6.09** *5*
$\gamma(Zn^{64})$ **0.98** *2* scin
1.30 *3*
2.25 *4*
3.25 *6*
No 3.8γ

57J01 T.Jacobi, H.A.Howe, W.Douh, Bull. Am. Phys. Soc. 2, No. 5, 259 B1 (1957).

Ga^{65} 31 34 15^{m}

τ		15.2^{m} 2	$Zn^{(64)}$(7-Mev d,n)	chem
β^+	10 4†	0.82 8		sl
	19 6†	1.39 4		
	56 3†	2.113 20		
	15 2†	2.237 15		

No 2.5β (<2†)

$\gamma(Zn^{65})$	0.0530 6	K/LM ~3.8	sl ce

(ce 0.053γ)/β ~0.1

57D07 H.Daniel, Z. Naturf. 12a, 363 (1957).

$\gamma(Zn^{65})$		$Zn^{(64)}$(7-Mev d,n)	chem
65 20†	0.118 3		scin
14 7†	0.738 6		
1.3 8†	0.906 8		
6 5†	1.378 30		
<1 †	1.858 30		

No 0.094γ

(0.118γ)(0.738, 0.906?, 1.858γ) scin

(~2-Mev β)(0.118γ) (< 2-Mev β)(other γ's) a

†Photons per 200 $\gamma^{\pm}$

57M11 T.Mayer-Kuckuk, Z.Naturf. 12A, 365 (1957).

Ga^{65} 31, 34

No 8^{m} activity found $Zn^{(64)}$(7-Mev d) chem

57D07 H.Daniel, Z. Naturf. 12a, 363 (1957).

Ga^{66} 31 35 9.4^{h}

β^+ longitudinal polarization ($J = 0^+$ to 0^+)

+0.09 31 $E_\beta > 1$ ($<v/c> = 0.98$)

Measured Møller scattering of β's by magnetized Deltamax foil scin ee

57F24 H.Frauenfelder, A.O.Hanson, N.Levine, A.Rossi, G.DePasquali, Phys. Rev. 107, 910 (1957).

β^+ longitudinal polarization ($J = 0^+$ to 0^+)

+1.0 2 $E_\beta = 2.6$ (v/c = 0.99)

+0.95 12 $E_\beta = 3.0$ (v/c = 0.99)

More spins parallel to direction of motion

Measured circular polarization of high energy γ's from annihilation in flight

57D23 M.Deutsch, B.Gittelman, R.W.Bauer, L.Grodzins, A.W.Sunyar, Phys. Rev. 107, 1733 (1957).

Ga^{66} 31 35

9.4^{h} ground state $Cu^{(63)}(\alpha,n)$ M

J 0

μ <0.001

57H86 J.C.Hubbs, W.A.Nierenberg, H.A. Shugart, J.L.Worchester, Phys. Rev. 105, 1928 (1957).

Ga^{67} 31 36 78^{h}

τ 77.9^{h} 3 differential ic

55T27 J.Tobailem, Ann. phys. 10, 783 (1955); Compt. rend. 233, 1360 (1951).

τ 79.0^{h} 3 As^{75}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

Ga^{67} 31 36

78^{h} ground state $Cu^{(65)}(\alpha,2n)$ M

J 3/2

57H86 J.C.Hubbs, W.A.Nierenberg, H.A. Shugart, J.L.Worchester, Phys. Rev. 105, 1928 (1957).

Levels Zn^{67}(p,n) E_p = 1.8 to 4.5

g.s. Q = −1.778 5 [thresh n, ~0°

0.357 11

0.85 2

1.54 2

57G30 R.A.Chapman, J.C.Slattery, Phys. Rev. 105, 633 (1957); Bull. Am. Phys. Soc. 1, No. 2, 95 N3 (1956).

Ga^{68} 31 37 68^{m}

$Zn^{(67)}$(7-Mev d,n) chem

β^+ 1.88 2 sl

57D07 H.Daniel, Z. Naturf. 12a, 363 (1957).

Ga^{68} 31 37

Levels Zn^{68}(p,n) E_p = 3.6 to 5.6

g.s. Q = −3.707 5 [thresh n, ~0°

0.188 8

0.342 10 0.848 11

0.574 13 1.57?

57C30 R.A.Chapman, J.C.Slattery, Phys. Rev. 105, 633 (1957); Bull. Am. Phys. Soc. 1, No. 2, 95 N3 (1956).

Ga^{69} 31 38

Ground state

μ_3 +0.137 5 M

Recalculated from data of 54D26; polarization effects not included

57S28 C.Schwartz, Phys. Rev. 105, 173 (1957).
54D26 R.T.Daly, J.H.Holloway, Phys. Rev. 96, 539 (1954).

Reaction γ $Ga^{69}(\alpha,\alpha'\gamma)$ E_α = 4.8; scin γ

0.322 3 $\epsilon B(E2) = 0.0079$ 16

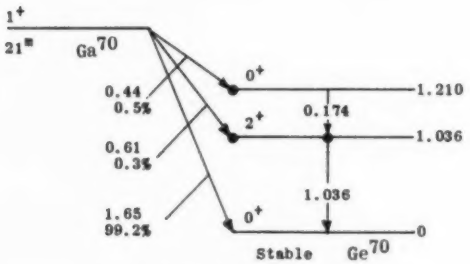
No (0.322γ)γ

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

Ga^{70} 31 39 21^m

τ	21.10^m 7	$Ga^{69}(n,\gamma)$	
β^-	~0.4	scin $\beta\gamma$	
	~0.6		
	1.65 1	sl	
$\gamma(Ge^{70})$			
0.44 9†	0.174 5	scin	
0.76 8†	1.036 10		

$(0.4\beta)(0.174\gamma)$ delay $\leq 4^{m\mu s}$ $(0.6\beta)(1.036\gamma)$
$(0.174\gamma)(1.036\gamma)(\theta)$ J = 0, 2, 0
No 1.21γ (< 0.004†) scin
No 1.21 $e^{\pm}$ pair (< 10^{-4}%) scin $\gamma^{\pm}\gamma^{\pm}$
No 1.21 e^- (< 0.02%) scin $(0.4\beta)e^-$
†Photons per 100 β's



57B141 M.E.Bunker, J.P.Mize, J.W.Starner, Phys. Rev. 105, 227 (1957); 95, 612A (1954).

Ga^{70} 31 39

Level	$Zn^{70}(p,n)$		E_p < 2
g.s.	Q = −1.435 5	thresh n	

No level excited below 0.50 Mev

57B145 J.W.Butler, C.R.Gossett, Bull. Am. Phys. Soc. 2, No. 4, 230 V4 (1957).

Ga^{71} 31 40

Ground state
$\mu(Ga^{71})/\mu(Ga^{69})$ = 1.2700 8 S

56J29 D.A.Jackson, Phys. Rev. 103, 1738 (1956).

Ground state
μ_3 +0.180 5 M
Recalculated from data of 54D26; polarization effects not included.

57S28 C.Schwartz, Phys. Rev. 105, 173 (1957).
54D26 R.T.Daly, J.H.Holloway, Phys. Rev. 96, 539 (1954).

Reaction γ $Ga^{71}(\alpha,\alpha'\gamma)$ E_α = 4.4; scin γ
0.513 5 $\epsilon B(E2)$ = 0.012 2
No $(0.513\gamma)\gamma$

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

Ge^{66} 32 34 ~2.5h

$\gamma(Ga^{66})$		$Zn^{(64)}$(52-Mev α,2n)		chem
10†	0.045 1			scin
~2†	0.070 1	~5†	0.186 4	
~5†	0.114 2		~0.36?	

56R49 R.A.Ricci, R. van Lieshout, Nuovo cim. 4, 1592 (1956).

Ge^{67} 32 35 20^m

τ	18.2^m 12	As^{75}(170-Mev p)	chem

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

τ	21^m 1	$Zn^{(64)}$(52-Mev α,n)	chem
$\gamma(Ga^{67})$	0.170		scin
$0.170\gamma/\beta^+ > 0.60$			$\gamma/\gamma^{\pm}$

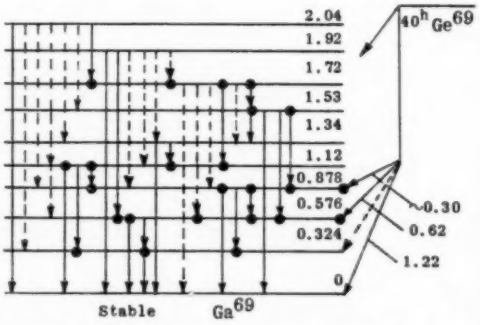
56R49 R.A.Ricci, R. van Lieshout, Nuovo cim. 4, 1592 (1956).

Ge^{69} 32 37 40^h

τ	40.4^h 3		$Ga^{(69)}$(d,2n)		chem
β^+	~0.30				scin $\beta\gamma$
~2†	0.62 5				scin
<1†	0.9?		~48†	1.22 3	
$\gamma(Ga^{69})$	0.190* 8		34 6†	0.88 2	scin
	0.20* 2			0.90* 8	
	0.24* 2		70 10†	1.12 1	
	0.30* 1		10 2†	1.34 2	
~5 †	0.32 1		1.0 5†	1.53 4	
37 5	0.576 8		<1 †	(1.73)	
	0.63* 5		1.0 5†	1.89 5	
<10 †	0.80* 8		1.0 5†	2.00 5	

*Observed in $\gamma\gamma$ spectrum only

$(\sim 0.30\beta)(0.88\gamma)$ $(0.62\beta)(0.576\gamma)$
$(< 2\%\ \beta^+)(0.32\gamma)$ No $(1.22\beta^+)$strong $\gamma)$
$(< 2\%\ \gamma^{\pm})(0.32\gamma)$ $(< 1\%\gamma^{\pm})(0.88\gamma)$
$(0.24\gamma)(0.88\gamma)$
$(\sim 1\%\ 1.12\gamma)(\sim 0.22\gamma)$
$(2\%\ 1.12\gamma)(\sim 0.60\gamma)$ $(10\%\ 1.34\gamma)(0.576\gamma)$
No 0.510γ from no $\gamma^{\pm}(0.510\gamma)$



57N20 R.H.Nussbaum, S.K.Suri, Phys. Rev. 105, 1272 (1957).

Ge^{70} 32 38

Level	$Ge^{70}(\alpha,\alpha'\gamma)$		E_α = 6.5
1.02 1	$\tau = 2.7^{\mu\mu s}$ 4		scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956).

Ge^{71} 32 39 11^{d}

τ **10.5^{d}** *4* As^{75}(170-Mev p) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala, 1956.

$\epsilon_L/\epsilon_K = 0.128^{+5}_{-3}$ $Ge^{(70)}$(pile n,γ) chem
concentric pc's in anti-coincidence
from (L x ray $+e_{AL}$)/(K x ray $+e_{AK}$)
Theoretical value for $\epsilon_L/\epsilon_K = 0.106$
Also measured ω_K(Ga) = 0.53 *3*

57D45 R.W.P.Drever, A.Moljk, Phil. Mag. 2, 427 (1957).

Ge^{71} 32 39

Resonances Ge^{70}(n,γ) E_n = 60 to 3000 ev
(Excitation = 7.15 Mev) pulsed n's
111.1 *33* ev scin
1039 *85*
1457 *140*

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

Ge^{72} 32 40

Level $Ge^{72}(\alpha,\alpha'\gamma)$ E_α = 6.5
0.830 *8* $\tau = 4.3^{\mu\mu s}$ *4* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Levels $Ge^{(73)}(\gamma,n)$ $E_\gamma \leq 20$
(0.835) Q = **−7.34** *15* thresh n
(1.46) Q = **−7.96** *15*

56T20 R.Tobin, J.McElhinney, Bull. Am. Phys. Soc. 1, No. 7, 340 P10 (1956).

Reaction γ's Ge^{72}(n,n'γ) E_n = 4.4
31† **0.637** *21* scin
97† **0.840** *13*
No 1.47γ (<1†)

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957); 99, 621A (1955).

Ge^{73} 32 41 0.53^{s}

τ **0.53^{s}** *3* Ge^{72}(pile n,γ) d 76^{d} As^{73} chem
$\gamma(Ge^{73})$ **0.054** scin

57C05 E.C.Campbell, P.Nelson, Phys. Rev. 107, 502 (1957).

Ge^{73} 32 41

Reaction γ $Ge^{73}(\alpha,\alpha'\gamma)$ E_α = 1.0 to 3.2
0.068 *1* $\epsilon B(E2)$ = 0.084 scin γ
0.815 *8* = 0.062
No 0.014 or 0.054γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 96, 426; 95, 629A; 93, 351 (1954).

Ge^{73} 32 41

Reaction γ $Ge^{(73)}(N^{14},N^{14'}\gamma)$ E_{N14} = 15.6
0.072 *2* scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

Ge^{74} 32 42

Level $Ge^{74}(\alpha,\alpha'\gamma)$ E_α = 6.0
0.593 *6* $\tau = 16^{\mu\mu s}$ *2* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Reaction γ's Ge^{74}(n,n'γ) E_n = 4.4
81† **0.607** *18* scin
5† **1.230** *19*

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957); 99, 621A (1955).

Resonances Ge^{73}(n,γ) E_n = 60 to 3000 ev
(Excitation = 10.14 Mev) pulsed n's
100.6 *28* ev **315** *14* scin
199.6 *76* **352*** *18*
221.7 *90* **471** *26*
*Also observed in Ge^{75}

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

Ge^{75} 32 43

Resonance Ge^{74}(n,γ) E_n = 60 to 3000 ev
(Excitation = 6.35 Mev) pulsed n's
352 *18* ev scin
Also observed in Ge^{74}

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

Ge^{76} 32 44

Level $Ge^{76}(\alpha,\alpha'\gamma)$ E_α = 4.0 to 6.5
0.566 *6* $\tau = 20^{\mu\mu s}$ *3* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956).

Ge^{77} 32 45

Resonances Ge^{76}(n,γ) E_n = 60 to 3000 ev
(Excitation = 5.9 Mev) pulsed n's
524 *31* ev scin
753 *53*
1000 *80*

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

As^{71} 33 38 62^{h}

τ **60^{h}** *3* $Cu(N^{14}),Cu(O^{16})$ chem
$\gamma(Ge^{71})$ **0.189** *12* scin

57B46 J.Beydon, R.Chaminade, M.Crut, H.Faraggi, J.Olkowsky, A.Papineau, Nuclear Phys. 2, 593 (1957).

As^{74} 33 41 18^{d}

τ **18.7^{d}** 2 As^{75}(49-Mev p,pn) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala, 1956.

As^{75}(≤350-Mev γ,n) chem
$\epsilon/(\beta^{+}+\beta^{-})$ = 0.67 4 arsine in pc
from (K x ray + e_{AK}) + (L x ray + e_{AL}) per β
ϵ/β^{+} = 1.49* for 0.92β^{+} (2^{-} to 2^{+} transition)
(theory predicts 1.2 for allowed transition)
(total ϵ_L)/(total ϵ_K) = 0.085 *20*
*If β^{+}/β^{-} = 0.89, 0.92 β^{+}/1.53 β^{+} = 8.4 and g.s. ϵ/β^{+} = 0.8

57S23 J.Scobie, Nuclear Phys. 3, 465 (1957).

As^{75} 33 42

Level $As^{75}(\gamma,\gamma)$ Se^{75} vapor
(0.265) $\tau \sim 7^{\mu\mu s}$ (half-life)
$\gamma\gamma(\theta)$ isotropic
τ from Γ determined from self-absorption of resonance radiation

56M75 F.R.Metzger, J. Franklin Inst. 262, 229 (1956).

Reaction γ's $As^{75}(\alpha,\alpha'\gamma)$ E_α = 6; scin

E_γ	$\epsilon B(E2)$
0.200 2	0.025 4
0.283 *3*	0.071 *11*
0.574 *6*	0.072 *11*
0.814 *8*	0.066 *10*

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Resonances $Ge^{74}(p,\gamma)$* E_p = 1.0 to 2.7
(Excitation = 7.75 to 9.33 Mev) scin

E_o	Γ(kev)	E_o	Γ(kev)	E_o	Γ(kev)
1.006	<2.5	**1.643**	~15	**2.161**	~15
1.094	9.5	**1.665**	~15	**2.210**	40
1.167	4.5	**1.690**	~30	**2.295**	27
1.213	<2.5	**1.805**	20	**2.342**	15
1.257	<2.5	**1.906**	~15	**2.440**	11
1.332	5.0	**1.926**	~15	**2.528**	15
1.422	<2.5	**1.972**	35	**2.593**	44
1.530	9.0	**2.074**	13.5	**2.664**	10
1.559	6.5				

E_o accuracy ±0.002
*Not Ge^{74}(p,n) no neutrons BF_3; no $18^{d}As^{74}$

57C37 D.R.Chick, S.E.Hunt, Nature 180, 88 (1957).

As^{76} 33 43 26.5^{h}

τ **26.8^{h}** *1* $As^{75}(n,\gamma)$
Decay followed for 5 half lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\gamma(Se^{76})$ As^{75}(0.025-Mev n,γ)
44.6% **(0.56)** scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

As^{76} 33 43 26.5^{h}

No ϵ_L arsine in pc
No ϵ_K (< 0.02% of β^{-})
From absence of L and K total absorption peaks

57S23 J.Scobie, Nuclear Phys. 3, 465 (1957).

$\gamma(Se^{76})$ As^{75}(pile n,γ)
(0.56) K/L > 8 sd ce
(0.64) α < 0.003 E0 < 0.2%
(ce 0.56γ)/β = 0.18
No 0.57γ (<5%) sd ce

57B04 G.Bäckström, Arkiv. Fysik 11, 357 (1957).

$\gamma(Se^{76})$ **(0.56)** E2 $\gamma\gamma(\theta)$
(0.64) E2/M1 = (98 ± 1)/(2 ± 1)

	A_2	A_4
(0.64γ)(0.56γ)(θ)	− 0.169 *15*	+ 0.293 *30*

J = 2, 2, 0
δ = − 7.2 *15*

57L35 T.Lindqvist, I.Marklund, Nuclear Phys. 4, 189 (1957).

As^{76} 33 43

26.5^{h} ground state
J **2** M

57C38 R.L.Christensen, H.G.Bennewitz, D.R. Hamilton, J.B.Reynolds, H.H.Stroke, Phys. Rev. 107, 633 (1957).

26.5^{h} ground state aligned As^{76}
J **2** $\gamma(\theta,H)$; double res
μ **− 0.906** 4

57P28 F.M.Pipkin, J.W.Culvahouse, Phys. Rev. 106, 1102 (1957).

As^{77} 33 44 39^{h}

$\gamma(Se^{77})$ **0.085** scin
0.245 scin
0.280 scin $\gamma\gamma$
0.525 scin
(0.280γ)(0.085, 0.245γ)
No ~0.03γ(shown due to bremsstrahlung)

57D51 V.S.Dubey, C.E.Mandeville, J.Franklin Inst. 263, 351 (1957); Bull. Am. Phys. Soc. 2, No. 3, 143 R4 (1957).

Se^{71} 34 37 5^{m}

τ **5^{m}** 2 Cu(~40-Mev N^{14}) chem
β GM
$\gamma(As^{71})$ **0.160** *10* scin
p $62^{h}As^{71}$? (weak 0.180γ observed) scin

57B43 J.Beydon, H.Faraggi, I.Gratot, M. Le Pape, Compt. rend. 244, 586 (1957).

Se^{72} 34 38 8.6^{d}

τ	**8.64^{d}** *6*	As^{75}(49-Mev p,4n)	chem
		$Cu(N^{14}),Cu(O^{16})$	chem
$\gamma(As^{72})$	**0.050**		scin

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

57B46 J.Beydon, R.Chaminade, M.Crut, F.Faraggi, J.Olkowsky, A.Papineau, Nuclear Phys. 2, 593 (1957).

τ	**8.40^{d}** *10*	$Ge^{70}(\alpha,2n)$	chem
$\gamma(As^{72})$	**0.0450** *10*	$\alpha_K = 0.64$	scin xx/xγ
		K/LM = 9.7	sl ce

(K x ray)(0.045γ) delay $\leq 20^{m\mu s}$

95 *8*% of ϵ to 0.045 level

No β^+ (< 0.5%)

57J16 N.R.Johnson, J.B.Cumming, M.Izawa, Bull. Am. Phys. Soc. 2, No. 4, 230 V5 (1957); verbal report.

Se^{73} 34 39 6.4^{h}

τ	**7.1^{h}** *3*	$Cu(N^{14}),Cu(O^{16})$	chem
$\gamma(As^{73})$ 1†	**0.067**		scin
~1†	**0.36** *1*		

57B46 J.Beydon, R.Chaminade, M.Crut, H.Faraggi, J.Olkowsky, A.Papineau, Nuclear Phys. 2, 593 (1957).

τ	**6.37^{h}** *10*	As^{75}(49-Mev p,3n) chem

56R45 G.Rudstam, Thesis, Univ. Uppsala (1956).

Se^{74} 34 40

Level	$Se^{74}(\alpha,\alpha'\gamma)$		$E_\alpha = 7$
0.635 *6*	$\tau = 13^{\mu\mu s}$		scin

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Level	$Se^{(74)}(\gamma,\gamma)$		As^{74} gas
(0.635)	$\tau = 4^{\mu\mu s}$ *2*		scin

55M100 F.R.Metzger, J. Franklin Inst. 260, 239 (1955).

Se^{75} 34 41 120^{d}

τ	**119.9^{d}** *6*	$Se^{(74)}(n,\gamma)$	chem
Decay followed for 2.2 half-lives			ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

Se^{75} 34 41

Levels	$As^{75}(p,n)$		$E_p < 2$
g.s.	Q = **−1.648** *4*		thresh n
0.286 *4*			

57B145 J.W.Butler, C.R.Gossett, Bull. Am. Phys. Soc. 2, No. 4, 230 V4 (1957).

460722 O-58-5

Se^{76} 34 42

Level	$Se^{76}(\alpha,\alpha'\gamma)$		$E_\alpha = 6$
0.567 *6*	$\tau = 12^{\mu\mu s}$ *2*		scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Se^{77} 34 43

Reaction γ's $Se^{77}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.5$ to 6.5

0.244 level	J = 3/2	B(E2) = 0.14
2% **0.086** *1*		scin $\alpha,\gamma(\theta)$
98% **0.244** *2*		

0.457 level	J = 5/2	B(E2) = 0.25
0.086 *1*		**0.244** *2*
48% **0.211** *2*	52%	**0.457** *5*

(0.211 γ)(0.244γ)

0.160γ of 17.5^{s} level observed, presumably as result of a 1% cascade from 0.457 level

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955); 93, 351 (1954).

Reaction γ's $Se^{(77)}(N^{14},N^{14}{}'\gamma)$ $E_{N^{14}} = 15.6$ scin

0.238 *4*

0.452 *9*

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

Se^{78} 34 44

Level	$Se^{78}(\alpha,\alpha'\gamma)$		$E_\alpha = 4.5$ to 6.8
0.615 *6*	$\tau = 9.0^{\mu\mu s}$ *14*		scin γ
	J = 2		$\alpha,\gamma(\theta)$

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Se^{79} 34 45 3.9^{m}

$\gamma(Se^{79})$	**0.096** *1*	$\alpha_K = 10^{*}4$	sm ce,pe
		K/L = 3.0 *5*	E3

*Using $\alpha_K = 7.1$ *15* for 0.103γ from $57^{m}Se^{81}$

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955), Columbia Tech. Transl. p.294.

Se^{80} 34 46

Level	$Se^{80}(\alpha,\alpha'\gamma)$		$E_\alpha = 6$
0.654 *7*	$\tau = 10.5^{\mu\mu s}$ *15*		scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Se^{81} 34 47 57^{m}

$\gamma(Se^{81})$	**0.100**	$\alpha_K = 8.6^{*}24$	sm ce, sm pe
		K/L = 4.0 *2*	E3

*Using $\alpha_{LM} = 12.0$ *5* for 0.088γ from $40^{s}Ag^{109}$

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov., Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955); Columbia Tech. Transl. p. 294.

Se^{82} 34 48

Level	$Se^{82}(\alpha,\alpha'\gamma)$		$E_\alpha = 6$
0.880 *9*	$\tau = 9.0^{\mu\mu s}$ *14*		scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

Se^{84} 34 50 — 3.3^m

τ	3.3^m 2		U(n,f) chem

From milking $33^m Br^{84}$ from Se

57S02 J.E.Sattizahn, M.Kahn, J.D.Knight, Bull. Am. Phys. Soc. 2, No. 4, 197 K8 (1957); verbal report.

Se^{85} 34 51 — 39^s

τ	39^s 4		U(n,f) chem

From milking of $3.0^m Br^{85}$ from Se

57S02 J.E.Sattizahn, M.Kahn, J.D.Knight, Bull. Am. Phys. Soc. 2, No. 4, 197 K8 (1957); verbal report.

Se^{86} 34 52 — 17^s

τ	17^s 3		U(n,f) chem

From milking $1.0^m Br$ from Se

57S02 J.E.Sattizahn, M.Kahn, J.D.Knight, Bull. Am. Phys. Soc. 2, No. 4, 197 K8 (1957); verbal report.

Br^{74} 35 39 — 36^m

τ	42^m 5		$Cu(N^{14})$ chem
$\gamma(Se^{74})$	0.64 1		scin

57B46 J.Beydon, R.Chaminade, M.Crut, H.Faraggi, J.Olkowsky, A.Papineau, Nuclear Phys. 2, 593 (1957).

Br^{75} 35 40 — 1.6^h

τ	1.6^h 1		$Cu(N^{14}), Cu(O^{16})$ chem
$\gamma(Se^{75})$	0.285 5		scin

57B46 J.Beydon, R.Chaminade, M.Crut, H.Faraggi, J.Olkowsky, A.Papineau, Nuclear Phys. 2, 593 (1957).

Br^{79} 35 44

Levels	$Br^{79}(\alpha,\alpha'\gamma)$		E_α = 2 to 4.2
	0.219 2	$\epsilon B(E2)$ = 0.023 5	scin γ
	0.310?		

No 0.044γ No γ in coincidence with 0.219γ

57W32 E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 105, 238 (1957); 100, 1265A (1955).

Br^{80} 35 45 — 18^m g.s.

τ	17.55^m 7		$Br^{(81)}(\gamma,n)$ chem

57K21 A.M.King, A.F.Voigt, Phys. Rev. 105, 1310 (1956).

Br^{80} 35 45 — 4.4^h

τ	4.38^h 2		$Br^{(81)}(\gamma,n)$ chem

57K21 A.M.King, A.F.Voigt, Phys. Rev. 105, 1310 (1957).

(ce 0.048γ)(ce 0.036γ)(β)

J = 6 or 5, 2^-, 1^+

55S91 B.A.Shakhbazyan, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 308 (1955). Columbia Tech. Transl. p.280.

Br^{81} 35 46

Level	$Br^{81}(\alpha,\alpha'\gamma)$		E_α = 2 to 4.2
	0.278 3	$\epsilon B(E2)$ = 0.029 6	scin γ

No γ in coincidence with 0.278γ

57W32 E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 105, 238 (1957); 100, 1265A (1955).

Br^{82} 35 47 — 36^h

β^-	100%	0.46 1		scin, scin $\beta\gamma$
$\gamma(Kr^{82})$		~0.25	0.82	scin $\gamma,\gamma\gamma$
		~0.35	1.03	
		0.56	1.29	
		0.61	1.45	
		0.69	w ~1.8	
		0.77	w ~2.0	

(0.56γ)(~0.25, ~0.35, 0.61, 0.69, 0.77, 1.29γ)
(0.77γ)(~0.25, ~0.35, 0.61, 0.69, 0.82, 1.29γ)
(1.03γ)(~0.25, 0.56, 0.77, 0.82γ)
(1.45γ)(~0.25, ~0.35, 0.56, 0.61, 0.82γ)

56D31 V.S.Dubey, C.E.Mandeville, M.A. Rothman, Phys. Rev. 103, 1430 (1956).

$\gamma(Kr^{82})$ $Br^{(81)}$(pile n,γ); sd pe

80†	0.5541 2	30†	0.8276 4
50†	0.6187 2	35†	1.0440 2
33†	0.6984 3	32†	1.3171 2
100†	0.7769 2	21†	1.4753 4

Calculated dosage rate: 14.4 1 r/hr mC at 1 cm
experimental value: 14.7 2 r/hr mC at 1 cm
Intensity ratios accurate to ±10%

57H83 S.Hultberg, A.Hedgran, Arkiv. Fysik 11, 369 (1957).

$\gamma(Kr^{82})$ $Br^{(81)}$(0.025-Mev n,γ)
25.5% (1.04) scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

Br^{82} 35 47

Level	Se^{82}(p,n)		E_p = 0.93 to 1.5
g.s.	Q > -0.92		BF_3

57J14 C.H.Johnson, A.Galonsky, J.P.Ulrich, Bull. Am. Phys. Soc. 2, No. 4, 177 D2 (1957); ORNL-2302 p.13 (1957).

Br^{84} 35 49 — 32^m g.s.

τ	31.80^m		U(n,f) chem
β^-	0.83		scin $\beta\gamma$
	1.39 10		
	1.81 6		
	2.80 10		
	3.83 7		
	4.76 10		scin
$\gamma(Kr^{84})$	0.29	1.48	[scin γ,
	0.37	1.57	[scin $\gamma\gamma$
	0.43	1.70	
	0.47	1.90	
	0.52	2.05	
	0.61	2.17	
	0.73	2.47	
	0.81	2.84	
	0.879 7	3.03	
	1.01	3.29	
	1.21	3.93 4	

(1.39β)(2.47γ) (3.83β)(0.879γ)
(2.80β)(1.90γ) No (4.76β)γ
(0.879γ)(0.29, 0.37, 0.43, 0.52, 0.61, 0.73, 0.81, 0.88?, 1.01, 1.21, 1.48, 1.57, 1.70, 1.90, 2.47, 2.84, 3.03, 3.29γ)
(1.90γ)(0.81, 0.88?, 1.01, 1.21, 1.57, 1.90, 2.05γ)

57J10 N.R.Johnson, G.D.O'Kelley, Bull. Am. Phys. Soc. 2, No. 1, 24 G4 (1957).

Br^{84} 35 49 6.0^{m}

U(n,f); Rb^{87}(14-Mev n,α) chem

τ		6.0^{m} 2			
β^-	20%	0.8 *1*			scin
	72%	1.9 2			
	8%	3.2			
γ(Kr^{84})					scin
	60%	0.44 *1*	60%	1.46 2	
	70%	0.88 *1*	20%	1.89 *3*	

Not d of 3.3^{m}Se

57S02 J.E.Sattizahn, M.Kahn, J.D.Knight, Bull Am. Phys. Soc. 2, No. 4, 197 K8 (1957); verbal report.

Br^{88} 35 53 15.5^{s}

τ 15.5^{s} 4 U^{235}(n,f) chem

Identified as a delayed-neutron precursor

57P19 G.J.Perlow, A.F.Stehney, Phys. Rev. 107, 776 (1957); Bull. Am. Phys. Soc. 2, No. 1, 16 E6 (1957).

Kr^{77} 36 41 1.1^{h}

τ 1.15^{h} *10* Cu(N^{14}), Cu(O^{16}) chem

57B46 J. Beydon, R. Chaminade, M. Crut, H. Faraggi, J. Olkowsky, A. Papineau, Nuclear Phys. 2, 593 (1957).

Kr^{78} 36 42

Reaction γ $Kr^{78}(\alpha,\alpha'\gamma)$ E_α = 6.1, 6.6

0.450 scin

57P26 G.F.Pieper, N.P.Heydenburg, C.E. Anderson, Bull. Am. Phys. Soc. 2, No. 1, 69 XA3 (1957).

Kr^{79} 36 43

Levels Kr^{78}(d,p) E_d = 3.8

g.s. Q = +5.98 *5* ppl 90°

0.46 *7*

56B110 N.C.Blais, W.W.Watson, Phys. Rev. 104, 202 (1956); Bull. Am. Phys. Soc. 1, No. 6, 281 B9 (1956).

Kr^{80} 36 44

Reaction γ $Kr^{80}(\alpha,\alpha'\gamma)$ E_α = 6.1, 6.6

0.620 scin

57P26 G.F.Pieper, N.P.Heydenburg, C.E. Anderson, Bull. Am. Phys. Soc. 2, No. 1, 69 XA3 (1957).

Kr^{81} 36 45

Levels Kr^{80}(d,p) E_d = 3.8

Assignment	Q	ppl 90°
Kr^{81}?	+5.63* *10*	
Kr^{81}, Kr^{83}?	+5.4*	
Kr^{81}	+5.04 *6*	
Kr^{81}	+4.57 *6*	

*From weak p groups near strong Kr^{79} group

56B110 N.C.Blais, W.W.Watson, Phys. Rev. 104, 202 (1956); Bull. Am. Phys. Soc. 1, No. 6, 281 B9 (1956).

Kr^{82} 36 46

Reaction γ $Kr^{82}(\alpha,\alpha'\gamma)$ E_α = 6.1, 6.6

0.780 scin

57P26 G.F.Pieper, N.P.Heydenburg, C.E. Anderson, Bull. Am. Phys. Soc. 2, No. 1, 69 XA3 (1957).

Kr^{83} 36 47

$Kr^{83}(\alpha,\alpha'\gamma)$ E_α = 6.1, 6.6

No γ observed (0.457γ assigned to Kr^{78}) scin

57P26 G.F.Pieper, N.P.Heydenburg, C.E. Anderson, Bull. Am. Phys. Soc. 2, No. 1, 69 XA3 (1957).

Kr^{84} 36 48

Reaction γ $Kr^{84}(\alpha,\alpha'\gamma)$ E_α = 6.1, 6.6

0.880 scin

57P26 G.F.Pieper, N.P.Heydenburg, C.E. Anderson, Bull. Am. Phys. Soc. 2, No. 1, 69 XA3 (1957).

Kr^{85} 36 49 10^{y} s.s.

(0.15β)(0.517γ) delay = 0.62$^{\mu s}$ *3* scin

56S113 J.G.Siekman, Nuclear Phys. 2, 254 (1956).

Atomic charge distribution following β^- decay

charge	%	charge	%	s
1	79.2 *10*			
2	10.9 *2*	7	0.40 *2*	
3	3.91 *12*	8	0.19 *2*	
4	3.12 *13*	9	0.093 *10*	
5	1.51 *7*	10	0.026 *6*	
6	0.66 *4*	11	< 0.003	

57S82 A.H.Snell, F.Pleasonton, Phys. Rev. 107, 740 (1957); Bull. Am. Phys. Soc. 1, No. 5, 263 E7 (1956).

Rb^{79}? 37 42 24^{m}

$Cu^{63}(O^{16})$, $Cu^{65}(O^{16})$, Cu(Ne^{20}), Ga(N^{14}) chem

τ	24^{m} *1*			
β^+	125†			scin
γ(Kr^{79})				
	100†	0.150 *10*		scin
	40†	0.185 *10*		
$\gamma^{\pm}$(0.150γ)				Σ scin

57C31 R.Chaminade, M.Cros, I.Gratot, M. Le Pape, Nuclear Phys. 2, 634 (1957).

57B46 J.Beydon, R.Chaminade, M.Crut, H.Faraggi, J.Olkowsky, A.Papineau, Nuclear Phys. 2, 593 (1957).

Rb^{85} 37 48

Reaction γ $Rb^{85}(\alpha,\alpha'\gamma)$ E_α = 4.4; scin γ

0.148 *1* εB(E2) = 0.0032 *6*

56P29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

Rb^{86} 37 49 — τ **18.68^d** *7* $Rb^{(85)}(n,\gamma)$ chem
Decay followed for 5 half-lives GM
19^d g.s.

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\beta\gamma$ delay < $100^{\mu\mu s}$ scin

55B148 E.E.Berlovich, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 343 (1955), Columbia Tech. Transl. p.305.

Rb^{86} 37 49 — Resonances $Rb^{85}(n,\gamma)$ E_n = 60 to 2600 ev (Excitation = 8.5 Mev) pulsed n's
520 *30* ev scin
1420 *136*

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

Rb^{87} 37 50 — Reaction γ $Rb^{87}(\alpha,\alpha'\gamma)$ E_α = 4.4; scin γ
0.407 *4* $\epsilon B(E2)$ = 0.0058 *12*

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

Rb^{88} 37 51 — Resonance $Rb^{87}(n,\gamma)$ E_n = 60 to 2600 ev (Excitation = 6.2 Mev) pulsed n's
370 *19* ev scin

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

Sr 38 — Relative isotopic abundances ms

Sr^{84}	**0.58%** *6*	Sr^{87}	**7.14%** *25*
Sr^{86}	**9.99%** *2*	Sr^{88}	**82.29%** *62*

56A50 P.A.Akishin, G.M.Panchenkov, N.V. Vasil'ev, O.T.Nikitin, Zhur. Fiz. Khim. SSSR 30, 1387 (1956); Chem. Abstr. 51-6385f (1957).

No ~ 10^dSr U(n,f) chem

56H77 G.Herrmann, F.Strassmann, Z.Naturf. 11a, 946 (1956).

Sr^{85} 38 47 — τ **64.0^d** *2* $Sr^{(84)}(n,\gamma)$ chem
Decay followed for 3.3 half-lives scin γ
64^d g.s.

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

τ **65.0^d** *7* U(n,f) chem

56H77 G.Herrmann, F.Strassmann, Z.Naturf. 11a, 946 (1956).

Sr^{87} 38 49 — τ **2.90^h** *8* U(n,f) chem
2.8^h

56H77 G.Herrmann, F.Strassmann, Z.Naturf. 11a, 946 (1956).

Sr^{87} 38 49 — Resonance $Sr^{86}(n,\gamma)$ E_n = 2 to 6000 ev (Excitation = 8.4 Mev) pulsed n's
610 ev scin

57R03 E.R.Rae, E.M.Bowey, J.Nuclear Energy 4, 179 (1957).

Sr^{88} 38 50 — Levels $Sr^{(88)}(e,e')$ E_e = 187
(1.85) $\tau \sim 0.097^{\mu\mu s}$ s 40° to 80°
(2.76) $\tau \sim 75^{\mu\mu s}$ for 2.76γ
From analysis of $\sigma(e,e')$

56H83 R.H.Helm, Phys. Rev. 104, 1466 (1956).

Resonance $Sr^{87}(n,\gamma)$ E_n = 2 to 6000 ev (Excitation = 11.1 Mev) pulsed n's
3.6 ev scin

57R03 E.R.Rae, E.M.Bowey, J.Nuclear Energy 4, 179 (1957).

Sr^{89} 38 51 — $\gamma(Y^{89})$ U(n,f) chem; scin
51^d ~0.01% **0.93** *5* from 13^s level in Y^{89}

56H77 G.Herrmann, F.Strassmann, Z. Naturf. 11a, 946 (1956).

Sr^{90} 38 52 — β^- **0.541** *8* ΔJ = 2, yes shape sl
28^y

56N21 T.D.Nainan, H.G.Deware, A.Mukerji, Proc. Indian Acad. Sci. 44A, 111 (1956).

U(n,f) chem
β^- **0.545** *5* ΔJ = 2, yes shape s

56B147 E.E.Berlovich, D.M.Khai, A.V.Savateev, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 275 (1956); Columbia Tech. Transl. p.259.

β^- longitudinal polarization $Sr^{90} + Y^{90}$
$-(\geq$ **0.82** *15*$)(v/c)$ E_β = 0.2 to 0.4
More spins antiparallel to direction of motion
Measured scattering of β's by Pt foil after deflection by multiple scattering

57H45 J.Heintze, Z. hysik 148, 560 (1957).

Sr^{92} 38 54 — τ **2.60^h** *4* U(n,f) chem
2.6^h
β^- 90% **0.55** *5* a
10% **1.5** *1*
$\gamma(Y^{92})$ ~1.5 a

56H77 G.Herrmann, F.Strassmann, Z. Naturf. 11a, 946 (1956).

Sr^{92} 38 54 2.6^h

τ 2.7^h 2 U(n,f) chem

β^- 90 10% 0.545 5 4π pc,scin

$\gamma(Y^{92})$ 39† 0.23 2 scin

45† 0.44 4

1000† 1.37 5

(0.545 β)(1.37γ) No (E_β>0.6)γ scin

No $\gamma\gamma$ scin

57H39 R.L.Heath, Phys. Rev. 105, 1011 (1957)

$_{39}Y$ Relative isotopic abundances ms

Y^{89} 100%

No Y^{86}, Y^{87}, Y^{88} (<1 x 10^{-5}%)

No Y^{90} (<3 x 10^{-4}%)

No Y^{91}, Y^{92} (<2 x 10^{-4}%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 198 (1957).

Y^{88} 39 49 105^d g.s.

$\gamma(Sr^{88})$ $Sr^{(88)}$(12-Mev p,n) scin

92† (0.90)

100† 1.83

0.5† 2.76

56T24 F.M.Tomnovec, Bull. Am. Phys. Soc. 1, No. 8, 391 M12 (1956).

Y^{88} 39 49 0.3^{ms}

Y^{89}(≤75-Mev γ,nγ); scin

τ 0.305^{ms} 6

57B139 A.J.Bureau, C.L.Hammer, Phys. Rev. 105, 1006 (1957).

Y^{90} 39 51 64^h

τ 64.4^h 4 $28^y Sr^{90}$ source chem

Decay followed for 2 half-lives GM

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

β^- 2.280 7 Δ J=2, yes shape s

56B147 E.E.Berlovich, D.M.Khai, A.V.Savateev, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 275 (1956); Columbia Tech. Transl. p.259.

τ 64.8^h 2 U(n,f) chem

56H77 G.Herrmann, F.Strassmann, Z. Naturf. 11a, 946 (1956).

β^- 2.28 3 ΔJ=2, yes shape sl

56N21 T.D.Nainan, H.G.Deware, A.Mukerji, Proc. Indian Acad. Sci. 44A, 111 (1956).

Y^{90} 39 51 64^h

$\beta^-\gamma^\pm$ delay = $6^{m\mu s}$ 2 scin $\beta^-\gamma^\pm\gamma^\pm$

$\gamma^\pm$ from EO transition from 1.75 level in Zr^{90}

e^+/β^- = 8 x 10^{-5} 3 scin $\beta^-\gamma^\pm\gamma^\pm$

57D19 M.Deutsch, Nuclear Phys. 3, 83 (1957).

β^- longitudinal polarization (J = 2^- to 0^+)

~−1.0 E_β ~ 1.8 (v/c ~ 0.975)

More spins antiparallel to direction of motion

Measured ~90% left-circular polarization of high energy external bremsstrahlung

57G37 M.Goldhaber, L.Grodzins, A.W.Sunyar, Phys. Rev. 106, 826 (1957).

e^+ 0.720 10 sl

e^+/β^- = 5.4 x 10^{-5} 8

56Y05 T.Yuasa, J.Laberrigue-Frolow, L.Feuvrais, Compt. rend. 243, 2045 (1956).

Y^{91} 39 52 58^d g.s.

τ 58.3^d 8 U(n,f) chem

$\gamma(Zr^{91})$

0.4% 1.2 1 scin

No 0.2γ (<0.1%)

56H77 G.Herrmann, F.Strassmann, Z. Naturf. 11a, 946 (1956).

Y^{93} 39 54 11^h

τ 11.0^h 4 U(n,f) chem

β^- 85% (3.1) 4π pc,scin β/γ

$\gamma(Zr^{93})$

100† 0.265 5 5† 1.15 2 scin

3.4† 0.455 8 10† 1.40 2

15† 0.675 10 23† 1.88 2

37† 0.940 10 8.5† 2.14 2

(0.265 γ)(0.675, 1.15, 1.88γ)

57H40 R.L.Heath, Bull. Am. Phys. Soc. 2, No. 4, 230 V6 (1957).

$_{40}Zr$ Levels $Zr(\alpha,\alpha'\gamma)$ E_α = 10

0.92 1 $\tau = 5.5^{\mu\mu s}$ 3 scin γ

Averages for Zr^{92} and Zr^{94}

57S110 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 1, 69 XA4 (1957); verbal report.

Zr^{90} 40 50

Level $Zr^{90}(n,n'+e^+e^-)$ pulsed n's

(1.75) $\tau = 71^{m\mu s}{}^{+7}_{-10}$ scin $\gamma^\pm$

57K29 R.M.Kloepper, R.B.Day, D.A.Lind, Bull. Am. Phys. Soc. 2, No. 1, 60 U6 (1957); verbal report.

Zr^{91} 40 51

Ground state

J 5/2 I

μ −1.29805

$\nu(Zr^{91})/\nu(H^2)$ = 0.60557 1

57B126 E.Brun, J.Oeser, H.H.Staub, Phys. Rev. 105, 1929 (1957).

Zr^{95} 40 55 65^{d}

β^-	43%	0.360 *5*		sπ
	55%	0.396 *5*		
	2%	0.885 *10*		
$\gamma(Nb^{95})$		0.726 *2*	$\alpha_K = 1.3 \times 10^{-3}$ *2* K/L = 9 *1* M1	sπ ce
		0.760 *3*	$\alpha_K = 1.80 \times 10^{-3}$ *25* K/L = 6 *1* E2	

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955), Columbia Tech. Transl. p.294.

(0.36β)(right circular $0.76\gamma)(\theta)$
(0.40β)(right circular $0.72\gamma)(\theta)$ } (unresolved)
$= 1 - (0.46\ 9)\langle v/c\rangle \cos\theta$
γ ray shown to be circularly polarized by forward scattering from magnetized iron

57A59 H.Appel, H.Schopper, Z.Physik 149, 103 (1957).

Zr^{97} 40 57 17^{h}

τ		17^{h} *1*	Zr^{96}(pile n,γ)
β^-		0.45	(sl β)(scin γ)
		1.91	sl
$\gamma(Nb^{97})$		~0.7 double	scin $\gamma\gamma$
	4 *1*%	1.35 *5*	scin
	~1.5 %	1.62 *3*	
	1.5 *5*%	2.20 *5*	
	≤1 %	2.58 *5*	
$(0.45\beta)(\sim 0.7\gamma, E_\gamma > 0.8)$			sl β, scin γ
$(E_\gamma > 0.25)(\sim 0.7, 1.35\gamma)$			scin
$(E_\gamma > 1.0)$(at least 2 γ's with $0.6 \leq E_\gamma \leq 0.8$)			

56D46 N.N.Delyagin, A.A.Sorokin, N.V. Forafontov, V.S.Shpinel, Nuclear Phys. 2, 687 (1956).

β^-	15†	0.48 *5*	Zr^{96}(slow n,γ); sl
	100†	1.90 *2*	

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

Nb^{90} 41 49 15^{h} g.s.

$\gamma(Zr^{90})$	0.0176 *10*		
	0.133 *3*		
	0.142 *2*	E2 100%	$\gamma\gamma(\theta)$
	0.370 *5*		
	0.511 *3*		
	0.900 *10*		
	1.137 *6*	E1 100%	$\gamma\gamma(\theta)$
	2.200 *20*		
	2.330 *10*		

$(0.142\gamma)(1.137\gamma)(\theta)$ $\eta(\pi) = -0.112$ *46* $\gamma\gamma(\theta)$
J = 8, 6, 5 if J = 5 for 2.315 level

57S51 R.K.Sheline, Bull. Am. Phys. Soc. 2, No. 5, 260 B6 (1957).

Nb^{93} 41 52

Reaction γ's	Nb^{93}(n,n'γ)		E_n = 4.4 scin
	0.7†	0.521 *10*	
	1.2†	0.759 *10*	
	1.3†	0.971 *10*	

†σ if $\sigma[Zr(n,n' + 0.926\gamma)] = 1.3$

57S61 R.M.Sinclair, Phys. Rev. 107, 1306 (1957).

Nb^{93} 41 52

Reaction γ's	Nb^{93}(n,n'γ)	E_n = 0.75 to 1.8	
	0.736 *8*	thresh = 0.772 *8*	scin
	0.957 *10*	= 0.987 *10*	
	Nb^{93}(p,p'γ)	E_p = 2.75 to 4.0	

No 0.71γ (now assigned to Mo^{94})

57R55 M.A.Rothman, D.M.Van Patter, V.S. Dubey, W.C.Porter, C.E.Mandeville, Phys. Rev. 107, 155 (1957); Bull. Am. Phys. Soc. 2, No. 1, 33 K6 (1957).

Nb^{94} 41 53

Resonance peaks	Nb^{93}(n)	E_n = 30 to 10,000 ev	
	35.9 ev	Γ_γ = 229 *5* mev	chopper
	42.2	Γ_γ = 186 *100* mev	
	94.3	381	
	106	463	
	119	500	
	194	746	
	244	947	
	320	1018	
	336	1184	

56S91 A.Saplakoglu, L.M.Bollinger, R.E.Coté, Bull. Am. Phys. Soc. 1, No. 7 347 X7 (1956); verbal report.

Nb^{95} 41 54 35^{d} g.s.

β^-	99%	0.160 *3*		sπ
	1%	0.93 *2*		
$\gamma(Mo^{95})$		0.770 *2*	$\alpha_K = 1.9 \times 10^{-3}$ *1* K/L = 7.4 *2* E2	sπ ce

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955), Columbia Tech. Transl. p.294.

Nb^{95} 41 54 90^{h}

τ		90^{h} *2*		
$\gamma(Nb^{95})$		(0.236)	K/L = 4.5 *1*	sπ ce

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955), Columbia Tech. Transl. p.294.

Nb^{97} 41 56 74^{m} g.s.

β^-	1.27	$17^{h}Zr^{97}$ source; sl
$\gamma(Mo^{97})$	0.665	scin
$(1.27\beta)(0.665\gamma)$		sl β, scin γ

No $\gamma\gamma$ in source chemically separated from 17^{h}Zr

56D46 N.N.Delyagin, A.A.Sorokin, N.V. Forafontov, V.S.Shpinel, Nuclear Phys. 2, 687 (1956).

β^-	1.18 *2*	$17^{h}Zr^{97}$ source; sl	
$\gamma(Mo^{97})$	0.666 *6*	α = 0.0025 *3*	sl ce/β

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

Nb^{97} 41 56 60^{s}

			17^{h} Zr^{97} source
$\gamma(Nb^{97})$	0.750 *5*	α = 0.0143 *17*	sl ce/β

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

Mo 42

Resonances — Mo(n)

E_0(ev)	Γ_n°(mev)*	Isotope
45 0.5	28 4	96
72 1	2.8 8	98
134 2.5	14.6 47	97

Resonances also observed at 162, 189, 283, 350, 400, 483, 715, 842 ev

*Γ_γ(mev) = 260 80 was used — chopper

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom. Energiya 1,No.5, 55 (1956).

Mo^{91} 42 49 16^m g.s.

Mo(92)(≤22-Mev γ,n)

β^+	3.44 3	sd
No γ		scin

56S96 F.B.Smith, N.B.Gove, R.W.Henry, R.A. Becker, Phys. Rev. 104, 706 (1956); 100, 1236A (1955).

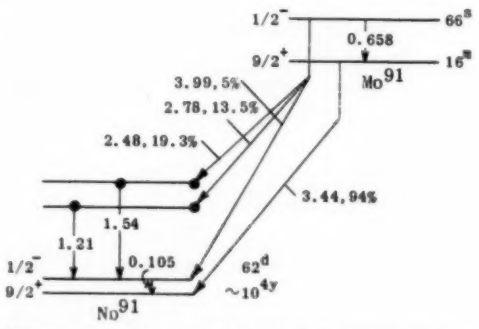
Mo^{91} 42 49 66^s

Mo(92)(≤22-Mev γ,n)

β^+	2.48 10	scin βγ
	2.78 10	scin βγ
	3.99 5	scin
γ(Mo^{91})	0.658 3 α = 0.055 15	scin
γ(Nb^{91}) 68†	1.21 3	
100†	1.54 2	

$\gamma^\pm/(0.658\gamma)$ = 1.4 2
(K x ray)/(0.658γ) = 0.15 5
(3.99β)/(2.48β + 2.78β) = 0.15 scin
(2.78β)(1.21γ) (2.48β)(1.54γ)
No $\gamma^\pm$(0.658γ) No (1.21γ)(1.54γ)

Mo^{91} 42 49



56S96 F.B.Smith, N.B.Gove, R.W.Henry, R.A. Becker, Phys. Rev. 104, 706 (1956); 100, 1236A (1955).

Mo^{93} 42 51

Level	Nb^{93}(p,n)	E_p = 1.3 to 2.1
	g.s. Q > -1.29	BF_3

57J14 C.H.Johnson, A.Galonsky, J.P.Ulrich, Bull. Am. Phys. Soc. 2, No. 4, 177 D2 (1957); ORNL-2302 p.13 (1957).

Mo^{94} 42 52

Level	Mo^{94}(α,α'γ)	E_α = 6.0
0.871 9	τ = 1.9 μμs 3	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Mo^{94} 42 52

Level	Mo^{94}(p,p'γ)	E_p = 3.0
0.874	τ = 2.3 μμs 2	scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Capture γ's — Nb^{93}(p,γ) E_p = 2.75 to 4.0

0.71 scin
0.87
(E_γ > 1.8)(0.71, 0.87γ)

57R55 M.A.Rothman, D.M.Van Patter, V.S. Dubey, W.C.Porter, C.E.Mandeville, Phys. Rev. 107, 155 (1957); J. Franklin Inst. 259, 261 (1955).

Mo^{95} 42 53

Reaction γ	Mo^{95}(α,α'γ)	E_α = 6.0
0.204 2	εB(E2) = 0.07	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955); 93, 351 (1954).

Reaction γ — $Mo^{(95)}(N^{14},N^{14}'\gamma)$ E_{N14} = 15.6

0.210 4 scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

Mo^{96} 42 54

Level	Mo^{96}(α,α'γ)	E_α = 6.0
0.778 8	τ = 3.1 μμs 5	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Level	Mo^{96}(p,p'γ)	E_p = 3.0
0.775	τ = 3.9 μμs 3	scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Mo^{98} 42 56

Level	Mo^{98}(α,α'γ)	E_α = 6.0
0.786 8	τ = 3.5 μμs 5	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Level	Mo^{98}(p,p'γ)	E_p = 3.0
0.780	τ = 4.1 μμs 4	scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

$Mo^{99}_{42\ 57}$ 67^h

τ	66.96^h 9	$Mo^{(98)}(n,\gamma)$	chem
Decay followed for 5.4 half-lives			ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\gamma(Tc^{99})$		$Mo^{(98)}$(0.025-Mev n,γ)	
72†	(0.14 + 0.18)		scin

†Photons per 100 disintegrations

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$Mo^{100}_{42\ 58}$

Level	$Mo^{100}(\alpha,\alpha'\gamma)$	E_α = 3 to 7	
0.528 5	$\tau = 10^{\mu\mu s}$ 2		scin γ
	J = 2		$\alpha\gamma(\theta)$

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Level	$Mo^{(100)}(N^{14},N^{14'}\gamma)$	E_{N14} = 15.6	
0.540 *10*			scin γ

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

$Mo^{101}_{42\ 59}$ 15^m

τ	14.61^m 7		
β^-	2.23 4		
$\gamma(Tc^{101})$	0.0833	0.896	scin
	0.193	1.02	
	0.403	1.19	
	0.515	1.54	
	0.585	1.68	
	0.707	2.08	

57O01 G.D.O'Kelley, Q.V.Larson, G.E.Boyd, Bull. Am. Phys. Soc. 2, No. 1, 24 G5 (1957).

β^-	0.6	1.2	s,scin
	0.7	1.6	
	0.8	2.2	
$\gamma(Tc^{101})$	0.080		scin
	0.191	α_K = 0.30 *6*	
	0.193*	0.95*	
	0.300*	1.024	
	0.40*	1.14*	
	0.51*	1.18	
	0.510	1.28*	
	0.590	1.38*	
	0.70*	1.46*	
	0.704	1.56	
	0.84*	1.66*	
	0.890	2.08	

Continued

$Mo^{101}_{42\ 59}$ 15^m

Continued

β(0.191γ) delay = 0.91^{ms}
(0.59 $\gamma\gamma$)(0.6, 1.2, 2.2β) (2.08 $\gamma\gamma$)(0.7β)
(0.51 $\gamma\gamma$)(0.8, 1.6, 2.2β) (0.70 $\gamma\gamma$)(0.6, 1.6β)
(0.70 $\gamma\gamma$)(1.28, 1.46$\gamma\gamma$) (0.510 $\gamma\gamma$)(0.51, 1.56$\gamma\gamma$)
(0.590 $\gamma\gamma$)(0.300, 0.704, 1.18, 1.38$\gamma\gamma$)
(0.890 $\gamma\gamma$)(0.704, 1.18$\gamma\gamma$) (0.95 $\gamma\gamma$)(1.024$\gamma\gamma$)
(0.84 $\gamma\gamma$)(1.14$\gamma\gamma$) (0.193 $\gamma\gamma$)(0.51, 1.28$\gamma\gamma$)
(1.38 $\gamma\gamma$)(0.40$\gamma\gamma$) (0.080 $\gamma\gamma$)(1.66$\gamma\gamma$)
*from scin $\gamma\gamma$

56M72 D.W.Martin, S.B.Burson, J.M.Cork, Bull. Am. Phys. Soc. 1, No. 7, 329 J5 (1956); verbal report.

$Tc^{94}_{43\ 51}$

Mo^{94}(p,n)		
Neutron threshold at E_p > 4.8		thresh n

57L06 C.Latapie, C.Lévi, L.Papineau, N. Saunier, Compt. rend. 245, 672 (1957).

$Tc^{95}_{43\ 52}$

Levels	Mo^{95}(p,n)		$E_p \leq 3.9$
g.s.	Q=−2.44*3		thresh n
0.35 *8*			
0.72 *6*			

0.63 *3* γ observed from E_p = 3.2 to 3.9
*For E_p = 2.6 only 20^h g.s. activity observed

57L23 C.Lévi, L.Papineau, Compt. rend. 244, 1358 (1957).

$Tc^{96}_{43\ 53}$

Mo^{96}(p,n)	
Neutron threshold at E_p = 3.75 5	thresh n

57L06 C.Latapie, C.Lévi, L.Papineau, N. Saunier, Compt. rend. 245, 672 (1957).

$Tc^{97}_{43\ 54}$

Mo^{97}(p,n)	
Neutron threshold at E_p = 2.95 5	thresh n

57L06 C.Latapie, C.Lévi, L.Papineau, N. Saunier, Compt. rend. 245, 672 (1957).

$Tc^{98}_{43\ 55}$ 1.5×10^{6y}

		Mo(22-Mev p) chem
τ	1.5 x 10^{6y} 7	specific activity

Measured (0.65 γ)(0.75γ) counting rate in sample containing 17.3% Tc^{98}

56O10 G.D.O'Kelley, Q.V.Larson, Southwide Chem. Conf., Dec. 1956.

$Tc^{98}_{43\ 55}$

Mo^{98}(p,n)	
Neutron threshold at E_p = 3.25 5	thresh n

57L06 C.Latapie, C.Lévi, L.Papineau, N. Saunier, Compt. rend. 245, 672 (1957).

$Tc^{99}_{43\ 56}$ 6.0^h

carrier free source from Mo^{99}

$\gamma(Tc^{99})$ (99%) **(0.140)**] K/LM = 5.87 *12* sl ce
(1%) **(0.142)**] $e_{KLL}:e_{KLX}:e_{KXY}$ = 1:0.48 *6*:0.05 *1* sl

Measurements give $\omega_K(Tc) = 0.70$ *3*

56L40 J.Laberrigue-Frolow, P.Radvanyi, J. phys. radium. 17, 944 (1956); Compt. rend. 242, 901 (1956).

$Tc^{99}_{43\ 56}$

0.181 level — 68^hMo^{99} source

g +1.5 2 — $\gamma\gamma(\theta,H)$

57R02 S.Raboy, V.E.Krohn, Bull. Am. Phys. Soc. 2, No. 4, 230 V7 (1957); verbal report.

$Tc^{100}_{43\ 57}$

$Mo^{100}(p,n)$

Neutron threshold at $E_p = 3.20$ *5* — thresh n

57L06 C.Latapie, C.Lévi, L.Papineau, N. Saunier, Compt. rend. 245, 672 (1957).

$Tc^{101}_{43\ 58}$ 14^m

τ	**14.0^m** *1*				
β^-	**1.07** *3*			**1.32** *3*	
$\gamma(Ru^{101})$			18†*	**0.385** *8*	scin
	7.6†*	**0.127** *4*	4†	**0.410** *10*	
	26†	**0.130** *3*	83†	**0.545** *5*	
	3.9†*	**0.183** *4*	10†	**0.635** *10*	
	23†	**0.186** *4*	12†	**0.720** *8*	
	8†	**0.235** *5*	3.6†	**0.846** *9*	
	1000†	**0.307** *4*	2.5†	**0.939** *10*	

(1.07β)(0.545γ) (1.32β)(0.307γ)
(0.127γ)(0.720γ) (0.186γ)(0.130γ)
(0.307γ)(0.127, 0.183, 0.235γ)
(0.545γ)(0.127, 0.183, 0.385γ) *From scin $\gamma\gamma$

57O01 G.D.O'Kelley, Q.V.Larson, G.E.Boyd, Bull. Am. Phys. Soc. 2, No. 1, 24 G5 (1957); verbal report.

$Tc^{102}_{43\ 59}$ 4.5^m

τ **4.5^m** — Ru^{102}(≤30-Mev n)

$\gamma(Ru^{102})$ **0.473** — scin
>0.66

Mass assignment from method of production and observation of 0.473γ known from $Ru^{102}(\alpha,\alpha'\gamma)$

3.8^m activity formerly assigned to Tc^{104} probably was due to this activity

57F14 J.Flegenheimer, D.Geithoff, Z. Naturf. 12a, 351 (1957).

$Tc^{102}_{43\ 59}$? 5^s

τ	**5^s** *1*	d	12^mMo chem
β^-	**4.2** *3*	a	

55P51 J.Flegenheimer, W.Seelmann-Eggebert, Proc. Intern. Conf. Peaceful Uses Atomic Energy, Geneva 7, 152 (1955); Z. Naturf. 9a, 806 (1954).

$Tc^{103}_{43\ 60}$? 1.2^m

τ **1.2^m** — Ru^{104}(≤30-Mev n)

Found after subtraction of Tc^{104} 18^m activity

57F14 J.Flegenheimer, D.Geithoff, Z. Naturf. 12a, 351 (1957).

$Tc^{104}_{43\ 61}$ 18^m

18^m activity observed from Ru^{104}(≤30-Mev n) but not from Ru^{102}(≤30-Mev n)

57F14 J.Flegenheimer, D.Geithoff, Z. Naturf. 12a, 351 (1957).

$Ru^{97}_{44\ 53}$ 2.4^d

$Ru^{(96)}$(slow n,γ) chem

$\gamma(Tc^{97})$ **0.219** *4* — sl pe

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

$Ru^{99}_{44\ 55}$

Reaction γ $Ru^{99}(\alpha,\alpha'\gamma)$ $E_\alpha = 2.5, 6.0$

0.0895 *9* $\epsilon B(E2) = 0.054$ scin γ

$\alpha,\gamma(\theta)$ $\eta(\pi) = 0.03$ *3*

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

$Ru^{100}_{44\ 56}$

Level $Ru^{100}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$

0.540 *5* $\tau = 21^{+\mu\mu s}_{-\ 3}$ scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Level $Ru^{100}(p,p'\gamma)$ $E_p = 2.1$ to 3.0

0.540 $\tau = 12.3^{+\mu\mu s}_{-\ 5}$ scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Reaction γ's $Ru^{100}(\alpha,\alpha'\gamma)$ $E_\alpha = 8, 10$

1.355 *16* level B(E2) = 0.0145* scin

0.540

0.815

(0.815γ)(0.540γ)

*1.0 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Ru^{101}_{44\ 57}$

Reaction γ's $Ru^{101}(\alpha,\alpha'\gamma)$ $E_\alpha = 2.5, 6.5$ scin

	E_γ	B(E2)		
	0.127 *1*	0.11	E2	$\alpha,\gamma(\theta)$
100†	**0.180** *2*			
143†	**0.307** *3*	0.036	M1 + E2	
	0.522 *5*	0.041		

(0.180γ)(0.127γ)

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 100, 961A (1955).

$Ru^{102}_{44\ 58}$

Level — $Ru^{102}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6.0$

0.473 5 $\tau = 18^{\mu\mu s}$ 3 — scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

Level — $Ru^{102}(p,p'\gamma)$ — $E_p = 1.5$ to 3.0

0.475 $\tau = 18.6^{\mu\mu s}$ 7 — scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Reaction γ's — $Ru^{102}(\alpha,\alpha'\gamma)$ — $E_\alpha = 8$, 10

1.100 9 level — B(E2) = 0.0112* — scin

0.475

0.625

(0.625γ)(0.475γ)

*0.77 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Ru^{103}_{44\ 59}$ 40^d

τ — **39.7^d** 6 — U(n,f) chem

Decay followed for 3.4 half-lives — ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

β^- — ~0.12 — sπ

75 20% — **0.23**

5 1% — **0.70**

$\gamma(Rh^{103})$ — **0.040** — K/L = 0.18 3 — sπ ce

L/M = 7 1 E3

0.498 — $\alpha_K = 5.4 \times 10^{-3}$ 1

K/L = 6.0 15

0.610

(ce 0.040γ)/β~1

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955), Columbia Tech. Transl. p.294.

Ru(102)(slow n,γ) chem

β^- — **0.216** 8 — sl

$\gamma(Rh^{103})$ — **0.497** 4 — sl pe

(ce 0.497γ)/β~**0.006** — sl

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

Level — $Ru^{104}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6.0$

0.362 4 $\tau = 48^{\mu\mu s}$ 7 — scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 99, 617A (1955).

$Ru^{104}_{44\ 60}$

Level — $Ru^{104}(p,p'\gamma)$ — $E_p = 1.5$ to 3.0

0.358 $\tau = 60^{\mu\mu s}$ 2 — scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Reaction γ's — $Ru^{104}(\alpha,\alpha'\gamma)$ — $E_\alpha = 8$, 10

0.893 7 level — B(E2) = 0.0121* — scin

0.358

0.535

(0.535γ)(0.358γ)

*0.83 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Ru^{105}_{44\ 61}$ 4.4^h

Ru(104)(slow n,γ) chem

β^- — **1.15** 2 — sl

$\gamma(Rh^{105})$ — **0.728** 4 — sl pe

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

$Ru^{106}_{44\ 62}$ 1.0^y

τ — **1.02^y** 1

57M47 W.F.Merritt, P.J.Campion, R.C.Hawkings, Can. J. Phys. 35, 16 (1957).

τ — **366.6^d** 9 — U(n,f) chem

56S87 R.P.Schuman, M.E.Jones, A.C.Mewherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

$Rh^{101}_{45\ 56}$ ~5^y

Ru(d) chem

$\gamma(Ru^{101})$ — **0.129** — scin

0.198

(0.198γ)(0.129γ)(θ) = 1 +0.16 P_2 +0.01 P_4

No 0.327γ

57G34 N.Goldberg, Bull. Am. Phys. Soc. 2, No. 4, 230 V9 (1957); verbal report.

$Rh^{102}_{45\ 57}$ 210^d

Ru(d) chem

(0.475γ)(0.626, 1.040γ) — scin

(0.695γ)(1.105γ) (0.766γ)(0.475, 0.626γ)

57G34 N.Goldberg, Bull. Am. Phys. Soc. 2, No. 4, 230 V9 (1957).

$Rh^{103}_{45\ 58}$

Level — $Rh^{103}(n,n'\gamma)$ — $E_n \leq 0.90$; scin γ

0.300 — thresh for 0.300γ

57R46 M.A.Rothman, D.M.Van Patter, V.S.Dubey, W.C.Porter, C.E.Mandeville, Bull. Am. Phys. Soc. 2, No. 1, 33 K6 (1957); verbal report.

Rh^{103} 45 58

Levels $Rh^{103}(n,n'\gamma)$ $E_n \sim 10$

0.040 level

τ **57.5^m** 5

$Rh^{103}(p,p'\gamma)$ $E_p = 0.8$ to 1.3

0.040 level scin K x ray

E3 Coulomb excitation shown. $\sigma = 3.7 \times 10^{-10}$ *11* at $E_p = 0.90$ ($\alpha_K = 40$, $\alpha_L = 470$ used)

0.365 level $E_p = 2.67$

0.06† **(0.325)**

100† **(0.365)**

† Branching ratio from (K x ray after bombardment)/(0.365 γ's during bombardment).

57J19 G.A.Jones, W.R.Phillips, Proc. Roy. Soc. 239A, 487 (1957); Physica 22, 1128A (1956).

Reaction γ's $Rh^{103}(n,n'\gamma)$ $E_n = 0.3$ to 2

0.300 scin

1† **0.365**

$\sim$1† $\sim$**0.60**

0.495γ not observed

†Relative intensity at $E_n = 2$

57R55 M.A.Rothman, D.M.Van Patter, V.S. Dubey, W.C.Porter, C.E.Mandeville, Phys. Rev. 107, 155 (1957); Bull. Am. Phys. Soc. 2, No. 1, 33 K6 (1957).

Reaction $Rh^{103}(n,p;\ n,pn)$ $E_n = 13.2$; ppl

Preferred emission of protons in forward direction for all E_p noted

Graphs of $\sigma(E_p)$ and $\sigma(\theta)$ given

57B127 G.Brown, G.C.Morrison, H.Muirhead, W.T.Morton, Phil. Mag. 2, 785 (1957).

Rh^{104} 45 59

Capture γ's Rh^{103}(th n,γ)

(Excitation = 6.80 Mev)

17 3† **0.096** 4 scin

$\leq$8 † **0.133** 3

19 4† **0.176** 3

9 2† **0.217** 4

Study covered $E_\gamma = 0.05$ to 0.30

†Photons/100 Rh^{103} captures if $\sigma_a = 150$

57E28 I.V.Estulin, L.P.Kalinkin, A.S. Melioransky, Nuclear Phys. 4, 91 (1957); Zhur. Eksptl.' i Teoret. Fiz. 31, 886 (1955); Soviet Phys. JETP 4, 752 (1957).

Rh^{105} 45 60 36.5^h g.s.

$Ru^{(104)}$(slow n,$\gamma\beta$) chem

β^- **0.256** *10* sl

0.560 *15*

$\gamma(Pd^{105})$ **0.164?** sl pe

0.320 *6*

56S119 V.S.Shpinel, G.A.Kuznetsova, Zhur. Eksptl.' i Teoret. Fiz. 30, 231 (1956); Soviet Phys. JETP 3, 216 (1956).

Rh^{107} 45 62 24^m

τ **23.0^m** *5* U(d,f) chem

β^- **1.3** scin

$\gamma(Pd^{107})$

100† **0.305** *3*

18† **0.385** *5*

1.6† **0.570** *5*

3† **0.880** *5*

(0.305 γ)(0.385γ)

56M96 C.A.Mallmann, S.Mayo, S.J.Nassiff, Rev. Mexicana Fis. 5, 185 (1956).

U(n,f),U(20-Mev d,f) chem

τ **23.0^m** *5*

β^- **1.25** a

(1.25 β)(0.305γ)

55B150 G.B.Baró, P.Rey, W.Seelmann-Eggebert, Republica Argentina Publicaciones de la Commision Nacional de la Energia Atomica, Chem. Series, Vol. 1, No. 3 (1955).

Pd 46

Resonances	Pd(n)		chopper	
E_o(ev)	$g\Gamma_n^o$(mev)*	E_o(ev)	$g\Gamma_n^o$(mev)*	
11.68 *12*	0.009 *1*	**148** *5*	0.22 *6*	
13.05 *13*	0.06[a] *1*	**183** *7*	0.65 *14*	
24.8 *2*	0.05[b] *4*	**283** *15*	3 *1*	
32.5 *5*	2.40[c] *70*	**355** *20*	0.68 *40*	
55 *1*	0.11 *4*	**427** *27*	2.0 *5*	
77.8 *20*	0.06 *2*	**891** *80*		
89.5 *24*	$\sim$10			

*Measured Γ_γ(mev): [a]241 *73*, [b]292 *200*, [c]180 *52*

For other resonances Γ_γ(mev) = 220 *63* was used

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom. Energiya 1, No. 5, 55 (1956).

Pd^{104} 46 58

Level $Pd^{104}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$

0.550 *6* $\tau = 12^{\mu\mu s}$ *2* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Pd^{104}(p,p'\gamma)$ $E_p = 3.0$

0.555 $\tau = 11.6^{\mu\mu s}$ *6* scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Pd^{105} 46 59

Reaction γ's $Pd^{105}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$

0.266 *3* ϵB(E2) = 0.04 *1* scin γ

0.433 *4* = 0.17 *5*

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308, 99, 617A (1955).

$Pd^{106}_{46\ 60}$ Level $Pd^{106}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$
0.510 5 $\tau = 14^{\mu\mu s}$ 2 scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Pd^{106}(p,p'\gamma)$ $E_p = 3.0$
0.513 $\tau = 14.0^{\mu\mu s}$ 5 scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Reaction γ's $Pd^{106}(\alpha,\alpha'\gamma)$ $E_\alpha = 8, 10$
1.120 8 level $B(E2) = 0.0109^*$ scin
0.513
0.607
(0.607γ)(0.513γ)
*0.73 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Pd^{108}_{46\ 62}$ Level $Pd^{108}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$
0.424 4 $\tau = 28^{\mu\mu s}$ 4 scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Pd^{108}(p,p'\gamma)$ $E_p = 3.0$
0.433 $\tau = 30^{\mu\mu s}$ 2 scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Reaction γ's $Pd^{108}(\alpha,\alpha'\gamma)$ $E_\alpha = 8, 10$
0.941 7 level $B(E2) = 0.0071^*$ scin
0.433
0.508
(0.508γ)(0.433γ)
*0.46 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Pd^{110}_{46\ 64}$ Level $Pd^{110}(\alpha,\alpha'\gamma)$ $E_\alpha = 2.5$ to 7.0
0.370 4 $\tau = 40^{\mu\mu s}$ 6 scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Pd^{110}(p,p'\gamma)$ $E_p = 3.0$
0.374 $\tau = 52.4^{\mu\mu s}$ 29 scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

$Pd^{110}_{46\ 64}$ Reaction γ's $Pd^{110}(\alpha,\alpha'\gamma)$ $E_\alpha = 8, 10$
0.812 7 level $B(E2) = 0.0087^*$ scin
0.374
0.438
(0.438γ)(0.374γ)
*0.56 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

Ag_{47} Reaction γ's $Ag(N^{14},N^{14'}\gamma)$ $E_{N14} = 15.6$
0.310 6 scin
0.409 8

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

Resonances Ag(n) E_n = 10 to 360 ev
(Excitation = 7 Mev) chopper

$\sigma_0(10^3 b)$	E_0(ev)	$g\Gamma_n$ (mev)	Γ_γ(mev)
2.65 66	16.6 2	2.6 3	151 23
3.53 64	30.8 3	5.45 82	121 13
6.38 138	52.2 6	17.2 19	112 24
1.31 54	56.1 20	6.8 15	216 85
8.51 187	72.2 20	22.3 49	65 35

11 additional resonances from 40 to 316 ev
Γ_n^0/D 0.54×10^{-4} 20 E_n = 5 to 225 ev

56F28 R.G.Fluharty, F.B.Simpson, O.D.Simpson, Phys. Rev. 103, 1778 (1956).

$Ag^{105}_{47\ 58}$ 39^d ground state Rh^{103}(40-Mev α,2n)
J 1/2 M
τ 39^d

56S100 H.B.Silsbee, W.A.Nierenberg, H.A. Shugart, P.O.Strom, Bull. Am. Phys. Soc. 1, No. 8, 389 M2 (1956).

$Ag^{107}_{47\ 60}$ Reaction γ $Ag^{107}(p,p'\gamma)$ $E_p = 1.75$
0.323 3 $\epsilon B(E2) = 0.002$ 1 sd ce_K

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ's $Ag^{107}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.0, 6.0$
0.318 3 $\epsilon B(E2) = 0.15$ scin γ
0.413 4 $= 0.21$

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 95, 861 (1954).

$Ag^{108}_{47\ 61}$ 2.3^m $\gamma(Pd^{108}+Cd^{108})$ $Ag^{(107)}$(0.025-Mev n,γ)
2.25% (0.61) scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$_{47}Ag^{108}_{61}$ Resonances $Ag^{(107)}(n,\gamma)$ (Excitation = 7.3 Mev) pulsed n's scin

E_o(ev)	$\sigma_o\Gamma_\gamma$(b ev)
(16)	498 *30*
(42)	281* *28*
(45)	51 *7*
(52)	882 *62*

*Includes Ag^{110} 41-ev resonance yield

57R03 E.R.Rae, E.M.Bowey, J. Nuclear Energy 4, 179 (1957).

Resonances $Ag^{(107)}(n)$ E_n = 5 to 90 ev (Excitation = 7.3 Mev) chopper

$\overline{\Gamma^o_n}$	1.5 *6* mev
$\underline{D}$	38 *6* ev
$\overline{\Gamma^o_n}/D$	0.40×10^{-4} *16*
$\overline{\Gamma_\gamma}$	135 *17* mev

56F28 R.G.Fluharty, F.B.Simpson, O.D. Simpson, Phys. Rev. 103, 1778 (1956).

$_{47}Ag^{109}_{62}$ $\gamma(Ag^{109})$ $14^h Pd^{109}$ source

(0.088) α = 20.6 scin γ/β

$_{40}^{s}$

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$_{47}Ag^{109}_{62}$ Reaction γ $Ag^{109}(p,p'\gamma)$ E_p = 1.75

0.308 *3* $\epsilon B(E2) \sim 0.0026$ sd ce_K

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ's $Ag^{109}(\alpha,\alpha'\gamma)$ E_α = 3.0, 6.0

0.305 *3* $\epsilon B(E2)$ = 0.17 scin γ

0.400 *4* = 0.24

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 95, 861 (1954).

$_{47}Ag^{110}_{63}$ τ 252.5^d *15* $Ag^{(109)}$(pile n,γ)

$_{253^d}$ Decay followed for 2.1 half-lives ic γ

57G07 K.W.Geiger, Phys. Rev. 105, 1539 (1957).

τ 253^d *4* $Ag^{(109)}$(pile n,γ)

2 samples counted for 0.4 half-life each GM

57T11 H.Thiry, Bull. Soc. Roy. Sci. Liège 26, 29 (1957).

$\gamma(Ag^{110})$ 0.116 K/L = 2.1 *1* sd ce

56B90 A.A.Bashilov, Nuclear Phys. 1, 629 (1956).

$_{47}Ag^{110}_{63}$ $\gamma(Cd^{110})$ 0.65625 *28* cryst

$_{253^d}$ 0.88492 *50*

57M02 P.Marmier et al., Cal. Tech. work 1954; priv. comm. via F.Boehm.

$\gamma(Cd^{110})$

0.08%* >1.67 $Be^9(\gamma,n)$

No 2.28γ (< 0.03%) $D(\gamma,n)$

*If E_γ = 1.8

56D48 B.S.Dzhelepov, I.A.Iaritsyna, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 343 (1956); Columbia Tech. Transl. p.314.

(0.656γ)(0.885, 0.937, 1.38, 1.50γ) scin

(0.937γ)(0.885γ) (1.38γ)(0.885γ, not 0.76γ)

(1.50γ)(0.76γ; not 0.885, 0.937γ)

(1.50γ)(0.656γ)/(1.50γ) = (1.38γ)(0.656γ)/(1.38γ)

(0.656 < E_γ < 0.76)(0.885γ, not 0.937γ)

	A_2	A_4
(0.885γ)(0.656γ)(θ)	+ 0.115 *32*	− 0.003 *34*
(0.937γ)(0.656γ)(θ)	+ 0.046 *38*	− 0.049 *41*
(0.937γ)(0.885γ)(θ)	+ 0.058 *29*	+ 0.037 *31*
(1.38γ)(0.885γ)(θ)	− 0.184 *28*	+ 0.011 *30*

57S03 M.Sakai, H.Ohmura, T.Momota, J. Phys. Soc. Japan 12, 985 (1957).

$_{47}Ag^{110}_{63}$ Resonance $Ag^{109}(n)$ cryst σ_s,σ_t (Excitation = 6.5 Mev)

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n(mev)	Γ_γ(mev)	J
34 *1*	5.194 *10*	13.4 *6*	136 *6*	1

56W38 R.E.Wood, Phys. Rev. 104, 1425 (1956).

Resonances $Ag^{(109)}(n,\gamma)$ (Excitation = 6.5 Mev) pulsed n's scin

E_o(ev)	$\sigma_o\Gamma_\gamma$(b ev)
(31)	485 *34*
(41)	281* *28*
(56)	330 *40*
(71)	684 *48*
(88)	131 *9*

*Includes Ag^{108} 42-ev resonance yield

57R03 E.R.Rae, E.M.Bowey, J. Nuclear Energy 4, 179 (1957).

Resonances $Ag^{(109)}(n)$ E_n = 5 to 90 ev (Excitation = 6.5 Mev) chopper

$\overline{\Gamma^o_n}$	2.8 *8* mev
$\underline{D}$	34 *3* ev
$\overline{\Gamma^o_n}/D$	0.82×10^{-4} *40*
$\overline{\Gamma_\gamma}$	134 *40* mev

56F28 R.G.Fluharty, F.B.Simpson, O.D. Simpson, Phys. Rev. 103, 1778 (1956).

$Ag^{111}_{47\ 64}$ 1.2^m

τ 1.23^m 5 Pd^{110}(15-Mev d,pβ) chem
e^- and K x ray a
No β (< 0.1%) scin
Not p $49^m Cd^{111}$ chem (< 0.01%)

57S22 U.L.Schindewolf, J.W.Winchester, C.D. Coryell, Phys. Rev. 105, 1763 (1957).

$Ag^{111}_{47\ 64}$

7.5^d ground state $Pd^{(110)}$(n,$\gamma\beta$) chem
J 1/2 M
μ −0.1450 *15*
Used K^{39} and Ag^{109} data

56W27 G.K.Woodgate, R.W.Hellworth, Proc. Phys. Soc. 69A, 581 (1956); Nature 176, 395 (1955).

Cd 48

Relative isotopic abundances ms
No Cd^{103}, Cd^{104}, Cd^{105}, Cd^{107}, Cd^{109}, Cd^{115}, Cd^{117} (< 0.01%)

56K32 L.Kerwin, Can. J. Phys. 34, 1080 (1956).

Resonance Cd(n) E_n = 14.5 to 11000 ev
peaks **29.3** ev chopper
104
144
160
17 other peaks assigned to Cd^{111}(1), Cd^{112}(7), Cd^{113}(1), Cd^{114}(7), Cd^{115}(1)

57S58 F.B.Simpson, R.G.Fluharty, Phys. Rev. 105, 616 (1957).

$Cd^{110}_{48\ 62}$

Level $Cd^{110}(\alpha,\alpha'\gamma)$ E_α = 6.0
0.654 *7* $\tau = 5.7^{\mu\mu s}$ *8* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Cd^{110}(p,p'\gamma)$ E_p = 3.0
0.656 $\tau = 5.3^{\mu\mu s}$ 2 scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076, p.9 (1956).

Reaction γ's $Cd^{110}(\alpha,\alpha'\gamma)$ E_α = 8, 10
1.476 level B(E2) = 0.0138* scin
0.656
0.820
(0.820γ)(0.656γ)
*0.88 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Cd^{111}_{48\ 63}$

0.247 level $2.8^d In^{111}$ source
q ~2 $\gamma\gamma(\theta,T)$

57S102 R.M.Steffen, Bull. Am. Phys. Soc. 2, No. 4, 231 W1 (1957); verbal report.

$Cd^{111}_{48\ 63}$

Reaction γ $Cd^{111}(\alpha,\alpha'\gamma)$ E_α = 6.0
0.340 *3* ϵB(E2) = 0.19 *3* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956).

Reaction γ $Cd^{(111)}(N^{14},N^{14'}\gamma)$ $E_{N^{14}}$ = 15.6
0.325 *6* scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P.Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl. i Teoret.Fiz. 30, 809 (1956).

Resonance Cd^{110}(n) E_n = 14.5 to 11000 ev
(Excitation = 7.31 Mev) chopper
90.0 ev Γ_n° = 11 *2* mev
Γ_γ = 140 *70* mev

57S58 F.B.Simpson, R.G.Fluharty, Phys. Rev. 105, 616 (1957).

$Cd^{112}_{48\ 64}$

Level $Cd^{112}(\alpha,\alpha'\gamma)$ E_α = 6.0
0.620 $\tau = 6.7^{\mu\mu s}$ *10* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Cd^{112}(p,p'\gamma)$ E_p = 3.0
0.610 $\tau = 7.2^{\mu\mu s}$ *3* scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076 p.9 (1956).

Reaction γ's $Cd^{112}(\alpha,\alpha'\gamma)$ E_α = 8, 10
1.295 *16* level B(E2) = 0.0082* scin
0.610
0.685
(0.685γ)(0.610γ)
*0.51 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

Resonances Cd^{111}(n) E_n = 14.5 to 11000 ev
(Excitation = 9.05 Mev) chopper

E_o(ev)	$g\Gamma_n$(mev)	Γ_γ(mev)
28.1	3.9	120 *50*
86.4	5.0	(113)
100	23	(113)
139	13	(113)
165	13.3	(113)
225		

233 May also be assigned to Cd^{114}

D **68** *15* ev E_n = 28 to 165 ev
Γ_n°/D **0.33 x 10^{-4}** *9* g = 1/2 assumed

57S58 F.B.Simpson, R.G.Fluharty, Phys. Rev. 105, 616 (1957).

$Cd^{113}_{48\ 65}$ Reaction γ's $Cd^{113}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$

0.290 *3* $\epsilon B(E2) = 0.46$ *7* scin γ

0.550? ≤ 0.14

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Reaction γ $Cd^{(113)}(N^{14},N^{14'}\gamma)$ $E_{N14} = 15.6$

0.297 *6* scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl. i Teoret. Fiz. 30, 809 (1956).

Resonance $Cd^{112}(n)$ $E_n = 14.5$ to 11000 ev

(Excitation = 6.46 Mev) chopper

66.8 ev $\Gamma_n^\circ = 1.6$ *7* mev

$\Gamma_\gamma = 30$ *10* mev

57S58 F.B.Simpson, R.G.Fluharty, Phys. Rev. 105, 616 (1957).

$Cd^{114}_{48\ 66}$ Level $Cd^{114}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$

0.550 *6* $\tau = 10^{\mu\mu s}$ *2* scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Cd^{(114)}(N^{14},N^{14'}\gamma)$ $E_{N14} = 15.6$

0.543 *10* scin γ

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl. i Teoret. Fiz. 30, 809 (1956).

Reaction γ's $Cd^{114}(\alpha,\alpha'\gamma)$ $E_\alpha = 8$, 10

1.200 *10* level $B(E2) = 0.012$* scin

0.555

0.645

$(0.645\gamma)(0.555\gamma)$

*0.76 times single proton estimate

1.363 level $B(E2) = 0.011$*

0.555

0.808

$(0.808\gamma)(0.555\gamma)$

*0.67 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

Levels $In^{(115)}(\gamma,p)$ $E_\gamma = 17.6$

4.1 *1** ppl

5.2 *1* **7.0** *1*

5.9 *1* **7.9** *1*

*Error in adopted value $S_p(In^{115}) = 6.5$ *3* has not been included

57R56 M.Rozkos, Czechslov. J. Phys. 7, 20 (1957).

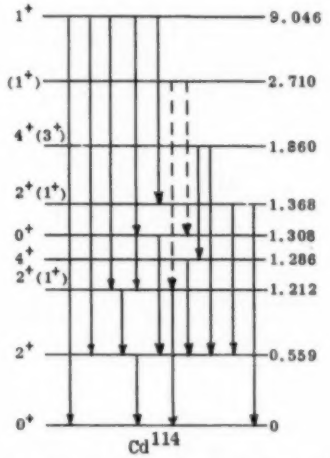
$Cd^{114}_{48\ 66}$ Capture γ's $Cd^{(113)}$(th n,γ)

85†	**0.559** 2			sl ce, Cp, pe
~7†	**0.576** 4			
23†	**0.654** 2	$\alpha = 0.0025$* 5		
6.5†	**0.728** 3	$\alpha = 0.0025$* *10*		
2.5†	**0.752** 5			
9.3†	**0.808** 3	$\alpha = 0.0021$* *10*		
6.5†	**1.210** 5			
5.7†	**1.298** 5	6†	**1.660** *10*	
11.6†	**1.370** 5	~3†	**1.845?** *15*	
5.5†	**1.403** 5	~2.5†	**~1.96?**	
4.4†	**1.498** 5	~3†	**2.455?** *15*	

Also observed ce assigned to $0^+ - 0^+$ transition of energy 1.305 *8*

†Photons/100 Cd captures

*If $\alpha(0.559\gamma) = 0.0043$



5 highest energy γ's taken from others

56M92 H.T.Motz, Phys. Rev. 104, 1353 (1956); 86, 604A (1952); 90, 355A (1953); 99, 656A (1955).

Resonances $Cd^{113}(n)$ $E_n = 14.5$ to 11000 ev

(Excitation = 9.50 Mev) chopper

E_o(ev)	$g\Gamma_n$(mev)	Γ_γ(mev)
(0.178)	0.49	(113)
18.6	0.12	(113)
63.9	2.8	80 *40*
85.4	16	(113)
109	13.5	(113)
192	66	(113)
215	40	(113)

233 May also be assigned to Cd^{112}

D **61** *18* ev $E_n = 0.17$ to 215 ev

Γ_n°/D $\mathbf{0.43 \times 10^{-4}}$ *13* $g = 1/2$ assumed

57S58 F.B.Simpson, R.G.Fluharty, Phys. Rev. 105, 616 (1957).

$Cd^{115}_{48\ 67}$ Resonance $Cd^{114}(n)$ $E_n = 14.5$ to 11000 ev

(Excitation = 6.03 Mev) chopper

121 ev $\Gamma_n^\circ = 2.8$ *1* mev

$\Gamma_\gamma = 200$ *35* mev

57S58 F.B.Simpson, R.G.Fluharty, Phys. Rev. 105, 616 (1957).

$Cd^{116}_{48\ 68}$ Level $Cd^{116}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$

0.508 5 $\tau = 14^{\mu\mu s}$ 2 scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 98, 1308; 99, 617A (1955).

Level $Cd^{116}(p,p'\gamma)$ $E_p = 3.0$

0.517 $\tau = 14.4^{\mu\mu s}$ 5 scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076 p.9 (1956).

Reaction γ's $Cd^{116}(\alpha,\alpha'\gamma)$ $E_\alpha = 8, 10$

1.217 *11* level B(E2) = 0.0130* scin

0.517

0.700

(0.700γ)(0.517γ)

*0.77 times single proton estimate

57S99 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 5, 267 L2 (1957); verbal report.

$Cd^{119}_{48\ 71}$ $\sim 10^m$ τ $Sn^{(122)}$(28-Mev d,αp) chem; U(d,f) chem

$\sim 10^m$

p $18^m In^{119}$ chem

57N21 N.Nussis, J.Pahissa, E.Ricci, Z.Naturf. 12a, 520 (1957).

$Cd^{121}_{48\ 73}$ 3.5^m τ $Sn^{(124)}$(28-Mev d,αp) chem; U(d,f) chem,

3.5^m $Sn^{(124)}$(n,α) chem

γ **0.85** scin

p 11.5^{m}and 32^{m}In chem

57N21 N.Nussis, J.Pahissa, E.Ricci, Z. Naturf. 12a, 520 (1957).

$In^{108}_{49\ 59}$ 40^m g.s. Cd^{106}(40-Mev α,2nϵ),

τ **40**^{m} 2 Ag^{107}(40-Mev α,3n) chem

β^+ **3.5** *1* sl

$\gamma(Cd^{108})$ **0.637** sl ce

56M94 W.Mead, UCRL-3488 (1956).

$In^{108}_{49\ 59}$ 55^m τ **55**^{m} Ag^{107}(40-Mev α,3n) chem

β^+ **1.4** *1* sl

$\gamma(In^{108}?)$

100* **0.246** K/L = 3.7 5 sl ce

$\gamma(Cd^{108})$

22* **0.330** K/L = 4

32* **0.637**

10* **0.878**

3* **1.05**

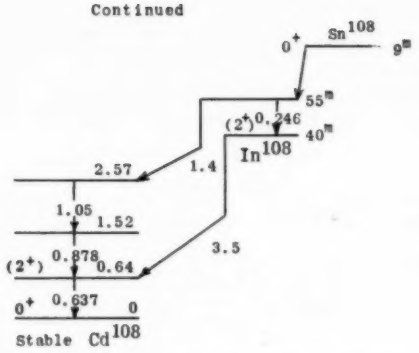
*Relative ce intensities

56M94 W.Mead, UCRL-3488 (1956); Phys. Rev. 100, 1794A (1955).

Continued

Continued

$In^{108}_{49\ 59}$



56M94 W.Mead, UCRL-3488 (1956); Phys. Rev. 100, 1794A (1955).

$In^{109}_{49\ 60}$ 4.3^h g.s. β^+ Ag^{107}(26-Mev α,2n) chem

~0.3? sl

5.6 6%$ **0.795** *10*

$\gamma(Cd^{109})$			α	K/LM	sl ce,
<1†	49 *3**	**0.0580** 5	>5	0.85 *8*	pe
100†	100 *	**0.205** *1*	0.07 *1*	7.6 *4*	
~4†	2.0 *7**	**0.227** *1*	0.04 *2*		
	1.4 *3**	**0.285** *2*		5	
	0.6 *2**	**0.325** *3*			
4†	1.4 *2**	**0.347** *3*	0.020 *8*	5.1 *5*	
9†	1.7 *2**	**0.427** *3*	0.014 *5*	8 *1*	
~40†	1.8 *4**	**0.632** *5*	0.0032 *15*		

Also weak 0.516, 0.530, 0.618, 0.710, 0.805, 1.15γ

(0.795β)(0.205γ) scin

(>0.205 γ)(ce 0.058γ) delay = $12^{\mu s}$ *3*

No (0.205 γ)(ce 0.058γ) delay

$From β^+/ce 0.088γ of Cd^{109}) using $\alpha = 23$

*Relative ce intensity

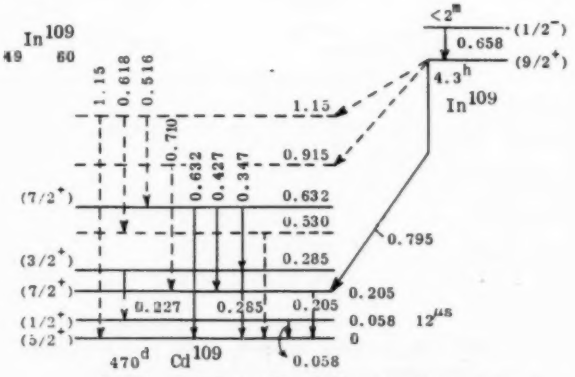
†Relative photon intensity

α's based on $\alpha = 0.12$ for In^{111} 0.172γ

56P39 M.D.Petroff, Bull. Am. Phys. Soc. 1, No. 8, 389 M3 (1956); UCRL 3538 (1956).

$In^{109}_{49\ 60}$ $<2^m$ τ $<2^m$ d $18^m Sn^{109}$ chem

$\gamma(In^{109})$ **0.658** $\alpha = 0.07$ 2 M4 sl ce



56P39 M.D.Petroff, Bull. Am. Phys. Soc. 1, No. 8, 389 M3 (1956); UCRL-3538 (1956).

$In^{113}_{49\ 64}$ 1.7^h

$\gamma(In^{113})$ **(0.392)** $\alpha = 0.52\ 5$ 118^dSn source

56A28 P.Avignon, Ann. Phys. 1, 10 (1956).

$In^{113}_{49\ 64}$

Ground state

$\mu(In^{115})/\mu(In^{113}) = +1.0021437\ 12$ I

57R42 M.Rice, R.V.Pound, Phys. Rev. 106, 953 (1957).

Ground state

$q(In^{115})/q(In^{113}) = +1.0138236\ 13$ M

μ_3 $+0.574^*15$

*Polarization effects not included

57E07 T.G.Eck, P.Kusch, Phys. Rev. 106, 958 (1957).

0.392 level

J **1/2** M

μ $+0.2098\ 4$ or $-0.2105\ 4$

56C52 W.J.Childs, L.S.Goodman, Bull. Am. Phys. Soc. 1, No. 7, 342 R1 (1956); priv. comm.

$In^{114}_{49\ 65}$ 50^d

τ **50.0^d** *3* $In^{(113)}(n,\gamma)$ chem

Decay followed for 5.3 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\gamma(In^{114})$ **(0.192)** K/L = 1.32 *2* prism s

L/M 4.4 *1* M/N = 4.6 *2*

$L_1:L_2:L_3$ = 24 *1*:127 *2*:100 E4

56K48 V.M.Kel'man, R.I.Metskhvarishvili, V.A. Romanov, L.I.Rusinov, K.A.Konoplev, Doklady Akad. Nauk SSSR 107, 394 (1956); Soviet Phys. Doklady 1, 189 (1956).

$\gamma(In^{114})$ **(0.192)** $\alpha = 4.3\ 4$ 4π scin ce/β

K/LM = 2.0 *6*

57H64 K.W.Hoffmann, Z.Physik 148, 298 (1957)a

γ 0.07%* >1.67 $Be^9(\gamma,n)$

No γ with $E_\gamma > 2.25$ (< 0.01%) $D(\gamma,n)$

*If $E_\gamma = 1.85$

56D48 B.S.Dzhelepov, I.A.Iaritsyna, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 343 (1956); Columbia Tech. Transl. p.314.

460722 O-58-6

$In^{114}_{49\ 65}$ 0.04^s

τ **0.04^s** *1* $Cd^{(114)}$(20-Mev p,n)

γ scin

56L46 O.I.Leipunskii, V.V.Miller, A.M. Morozov, P.A.Iampol'skii, Doklady Akad. Nauk SSSR 109, 935 (1956); Soviet Phys. Doklady 1, 505 (1956).

$In^{114}_{49\ 65}$

Resonances $In^{(113)}(n)$

E_o(ev)	Γ_n^o(mev)*	E_o(ev)	chopper Γ_n^o(mev)*
14.67 *23*	1.95 *20*	**25.0** *5*	2.0 *3*
19.7 *3*		**32.3** *7*	1.8 *4*
21.4 *4*	0.54 *12*	**70.0** *24*	3.4 *12*

$\underline{D}$ **9** ev E_n = 14 to 33 ev

Γ_n^o/D 1.8×10^{-4}

*Γ_γ(mev) = 80 *20* and g = 1/2 were used

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J. Nuclear Energy 5, 92 (1957); Atom. Energiya 1, No. 5, 55 (1956).

$In^{115}_{49\ 66}$ 4.5^h

$\gamma(In^{115})$ **(0.335)** $Cd^{(114)}(n,\gamma\beta)$ chem

K/LM = 3.75 *15* sl ce

$e_{KLL}:e_{KLX}:e_{KXY}$ sl

= 1:0.42 *10*:0.05 *2*

Measurements give ω_K(In) = 0.87 *3*

56L40 J.Laberrigue-Frolow, P.Radvanyi, J. phys. radium 17, 944 (1956); Compt. rend. 242, 901 (1956).

$In^{115}_{49\ 66}$

Ground state

$\mu(In^{115})/\mu(In^{113}) = +\ 1.0021437\ 12$ I

57R42 M.Rice, R.V.Pound, Phys. Rev. 106, 953 (1957).

Ground state

$q(In^{115})/q(In^{113}) = +\ 1.0138236\ 13$ M

μ_3 $+0.565^*12$

*Polarization effects not included

57E07 T.G.Eck, P.Kusch, Phys. Rev. 106, 958 (1957).

Levels $In^{(115)}(p,p')$ E_p = 7

1.078 *10* s

1.135 *10*

1.292 *10*

1.982 *10*

57S49 R.D.Sharp, W.W.Buechner, Bull. Am. Phys. Soc. 2, No. 4, 179 D13 (1957); verbal report.

Reaction γ $In^{(115)}(N^{14},N^{14'}\gamma)$ E_{N14} = 15.6

0.562 *10* scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

$In^{115}_{49\ 66}$? Reaction γ $In^{(115)}(p,?\gamma)$ E_p = 2.2 to 3.5

0.512 *12*		scin

Excitation function indicates reaction proceeds via compound nucleus

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, H.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

$In^{116}_{49\ 67}$ Resonances $In^{(115)}(n)$ chopper

E_o(ev)	Γ_n^o(mev)*	E_o(ev)	$g\Gamma_n^o$(mev)*
9.00 *11*	0.58 *14*		
12.0 *2*	0.034 *3*	**63** *2*	
22.8 *4*	0.28 *4*	**84** *3*	1.45 *49*
39.8 *10*	0.65 *12*	**95** *4*	0.23 *10*
47.9 *13*	0.14 *4*	**129** *6*	

$\overline{\Gamma_n^o/D}$ **0.26 x 10^{-4}** *8*

$\overline{\Gamma_\gamma}$(mev) = 80 *20* and g = 1/2 were used

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom Energiya 1, No. 5, 55 (1956).

Resonances $In^{(115)}(n)$ E_n = 0.004 to 0.25 (Excitation = 6.48 to 6.73 Mev)

$\langle\Gamma_\gamma/D\rangle$	**5.5 x 10^{-3}** for l_n = 0 and
	5.5 x 10^{-3} for l_n = 1
$\langle\Gamma_n^o/D\rangle$	**0.31 x 10^{-4}** for l_n = 0 and
	1.24 x 10^{-4} for l_n = 1

57N06 H.W.Newson, E.G.Bilpuch, Bull. Am. Phys. Soc. 2, No. 4, 218 S7 (1957).

$In^{121}_{49\ 72}$ 12^m 32^m d 3.5^mCd chem

τ	**11.5^m**	
β^-		
γ	**0.85**	scin
τ	**32^m**	
β^-		
γ	**0.52**	scin

Either or both activities may be assigned to In^{121}

57N21 N.Nussis, J.Pahissa, E.Ricci, Z.Naturf. 12a, 520 (1957).

Sn? 50

τ	**19^m** *1*	Cd(15-Mev α) chem
γ	**0.078**	sl ce

Not identical with $18^m Sn^{109}$ activity

56P39 M.D.Petroff. Bull. Am. Phys. Soc. 1, No. 8, 389 M3 (1956); UCRL-3538 (1956); Phys. Rev. 98, 279A (1955).

$Sn^{108}_{50\ 58}$ 9^m τ **9^m** Cd^{106}(28-Mev α,2n) chem

p $40^m In^{108}$

56M94 W.Mead, UCRL-3488 (1956).

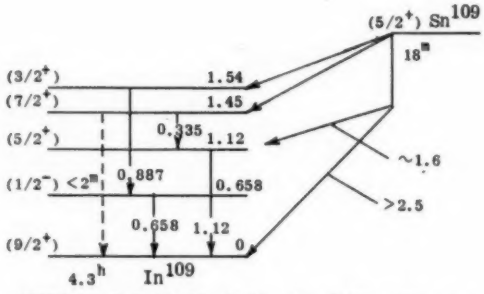
$Sn^{109}_{50\ 59}$ 18^m

τ	**18.1^m** *3*	Cd^{106}(15-Mev α,n) chem		
β^+	~1.6			sl
	>2.5			
$\gamma(In^{109})$				sl ce
	98*	**0.335**		
	14*	**0.521**	12*	**0.887**
	1000*	**0.658**	27*	**1.12**

$\epsilon/\beta^+ \sim 4$ *Relative ce intensities

No 0.078γ

p $4.3^h In^{109}$ from growth of 0.205γ sl ce



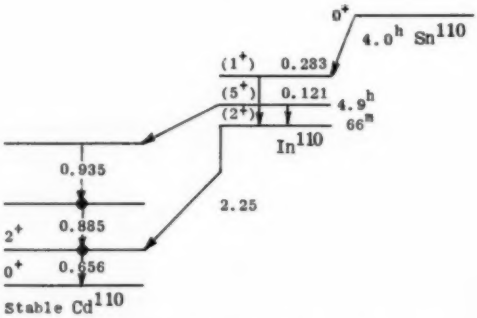
56P39 M.D.Petroff. Bull. Am. Phys. Soc. 1, No. 8, 389 M3 (1956); UCRL-3538 (1956); Phys. Rev. 98, 279A (1955).

$Sn^{110}_{50\ 60}$ 4.0^h

		Cd^{108}(30-Mev α,2n) chem	
		not by Cd^{106}(30-Mev α) chem	
τ	**4.0^h** *2*		
$\gamma(In^{110})$	**0.283**	$\alpha \sim 0.06$	sl ce,pe
		K/LM = 8 *1*	

p $66^m In^{110}$ from growth and decay of $2.2\beta^+$,0.66γ

Not p $4.9^h In^{110}$ (no 0.121, 0.884, 0.935γ)



56M94 W.Mead, UCRL-3488 (1956); Phys. Rev. 100, 1794A (1955).

$Sn^{112}_{50\ 72}$ Level $Sn^{112}(\alpha,\alpha'\gamma)$ E_α = 14.5

1.26	τ = 0.47$^{\mu\mu s}$	scin γ

57A33 D.C.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{113}_{50\ 63}$ $\gamma(In^{113})$ $Cd^{(114)}(\alpha, n)$ chem
$^{118^d}$ 2.8* 0.253 scin
1000* 0.392 s ce
*Relative ce_K intensities

57A09 W.T.Achor, W.E.Phillips, J.I.Hopkins, S.K.Haynes, Bull. Am. Phys. Soc. 2, No. 5 259 B2 (1957); verbal report.

$Sn^{114}_{50\ 64}$ Level $Sn^{114}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
1.30 $\tau = 0.36^{\mu\mu s}$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{115}_{50\ 65}$ $Sn^{115}(\alpha, \alpha'\gamma)$ $E_\alpha = 4$
No γ observed scin

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

$Sn^{116}_{50\ 66}$ Level $Sn^{116}(\alpha, \alpha'\gamma)$ $E_\alpha = 10$
1.268 *10* $\tau = 0.50^{\mu\mu s}$ 4 scin γ
J = 2 $\alpha, \gamma(\theta)$

57S110 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 1, 69 XA4 (1957); verbal report.

Level $Sn^{116}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
1.29 $\tau = 0.39^{\mu\mu s}$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{117}_{50\ 67}$ $\gamma(Sn^{117})$ $Cd^{(114)}(\alpha, n)$ chem
$^{14^d}$ 99% (0.159) scin
(0.162)
~1% 0.320 scin, s ce

56K43 S.M.Kalebin, Zhur. Eksptl' i Teoret. Fiz. 30, 957 (1956); Soviet Phys. JETP 3, 799 (1956).

$Sn^{117}_{50\ 67}$ Reaction γ's $Sn^{117}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
0.865 $\epsilon B(E2) = 0.025$ scin γ
1.03 $\epsilon B(E2) = 0.09$

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{117}(\alpha, \alpha'\gamma)$ $E_\alpha = 4$
No γ observed scin

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

$Sn^{118}_{50\ 68}$ Level $Sn^{118}(\alpha, \alpha'\gamma)$ $E_\alpha = 10$
1.219 *10* $\tau = 0.56^{\mu\mu s}$ 4 scin γ
J = 2 $\alpha, \gamma(\theta)$

57S110 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 1, 69 XA4 (1957); verbal report.

Level $Sn^{118}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
1.22 $\tau = 0.53^{\mu\mu s}$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{119}_{50\ 69}$ Reaction γ $Sn^{119}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
0.907 $\epsilon B(E2) = 0.11$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{119}(\alpha, \alpha'\gamma)$ $E_\alpha = 4$
No γ observed scin

56F29 L.W.Fagg, E.H.Geer, E.A.Wolicki, Phys. Rev. 104, 1073 (1956); Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956).

$Sn^{120}_{50\ 70}$ Level $Sn^{120}(\alpha, \alpha'\gamma)$ $E_\alpha = 10$
1.155 *10* $\tau = 0.69^{\mu\mu s}$ 4 scin γ
J = 2 $\alpha, \gamma(\theta)$

57S110 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 1, 69 XA4 (1957); verbal report.

Level $Sn^{120}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
1.18 $\tau = 0.68^{\mu\mu s}$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{122}_{50\ 72}$ Level $Sn^{122}(\alpha, \alpha'\gamma)$ $E_\alpha = 10$
1.130 *10* $\tau = 0.75^{\mu\mu s}$ 6 scin γ
J = 2 $\alpha, \gamma(\theta)$

57S110 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 1, 69 XA4 (1957); verbal report.

Level $Sn^{122}(\alpha, \alpha'\gamma)$ $E_\alpha = 14.5$
1.15 $\tau = 0.88^{\mu\mu s}$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

$Sn^{124}_{50\ 74}$ Level $Sn^{124}(\alpha, \alpha'\gamma)$ $E_\alpha = 10$
1.128 *10* $\tau = 0.85^{\mu\mu s}$ 5 scin γ
J = 2 $\alpha, \gamma(\theta)$

57S110 P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 2, No. 1, 69 XA4 (1957); verbal report.

Sn^{124} 50 74

Level $Sn^{124}(\alpha,\alpha'\gamma)$ $E_\alpha = 14.5$
1.13 $\tau = 1.02^{\mu\mu s}$ scin γ

57A33 D.G.Alkhazov, I.K.Lemberg, D.S. Andreyev, K.I.Erokhina, priv. comm. May 1957.

Sn^{125} 50 75 9.9^d

β^- **0.4** double Sn^{124}(pile n,γ) chem scin $\beta\gamma$
1.3
(2.35) scin

$\gamma(Sb^{125})$					
			18†	**0.904** *5*	scin
9†	**0.342** *3*	73†	**1.068** *4*		
10†	**0.468** *3*	3†	**1.41** *1*		
20†	**0.811** *5*	24†	**1.97** *2*		

No 0.09γ (0.4β)(0.81, 0.90, 1.07, 1.97γ) scin
(1.3β)(1.07γ) (0.47 γ)(0.34γ, 1.41γ)
(1.07 γ)(0.34, 0.47, 0.81, 0.90γ) No other $\gamma\gamma$
(0.4β)(1.07γ)/(1.34β)(1.07γ) ~1.5

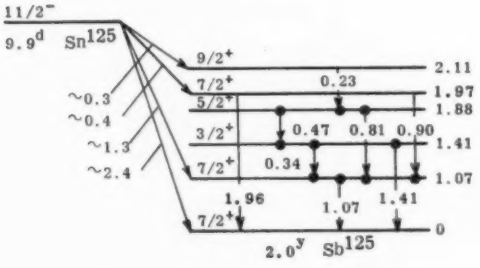
57B140 S.B.Burson, J.M.LeBlanc, D.W.Martin, Phys. Rev. 105, 625 (1957); 99, 660A (1955).

Sn^{125} 50 75 9.9^d

β^- ~**2.4** Sn^{124}(pile n,γ) chem scin

$\gamma(Sb^{125})$			
	0.23		scin $\gamma\gamma$
14.5†	**0.34**		scin $\gamma,\gamma\gamma$
26.5†	**0.47**	166†	**1.07**
83†	**0.81**	10†	**1.41**
50†	**0.90**	40†	**1.96**

(0.23 γ)(0.47, 0.81, 1.07, 1.41γ)
(0.47 γ)(0.34, 1.07, 1.41γ)
(1.07 γ)(0.34, 0.81, 0.90γ)



56D31 V.S.Dubey, C.E.Mandeville, M.A. Rothman, Phys. Rev. 103, 1430 (1956).

Sn^{125} 50 75 9.5^m

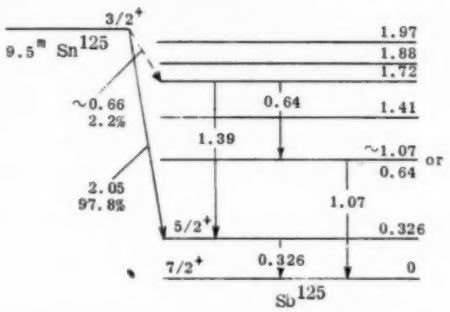
$\gamma(Sb^{125})$			
99.7†	**0.326** *3*	Sn^{124}(pile n,γ) scin	
0.3†	**0.64** *2*		
0.3†	**1.07** *2*		
1.9†	**1.39** *1*		

(2.0β)(0.326γ) a
(1.07 γ)(0.64γ) (0.326 γ)(1.39γ) scin
No other $\gamma\gamma$

Continued

Sn^{125} 50 75 9.5^m

Continued



Levels 1.41, 1.88, 1.97, seen in decay of 9.9^d Sn^{125}.

S.B.Burson, J.M.LeBlanc, D.W.Martin, Phys. Rev. 105, 625 (1957); 99, 660A (1955).

Sn^{128} 50 78 57^m

τ **(57^m)** U(28-Mev d,f) chem p $10^m Sb^{128}$

Mass assignment made by observation of 0.75γ in decay of $10^m Sb^{128}$ daughter

56F32 I.Fränz, J.Rodriguez, R.Radicella, Z. Naturf. 11a, 1037 (1956).

$Sb^?$ 51 6.2^d

τ **6.2^d** *2* U(26-Mev d,f) chem
γ 2€† **0.417** *10* 10† **0.900** *20* scin
0.560?*15* ~5† **1.100** *20*
100† **0.685** *15* ~1† **1.350** *20*

57B131 H.Bosch, H.Munczek, Phys. Rev. 106, 983 (1957); Ciencia e invest. (Buenos Aires) 12, 244 (1956).

Sb^{119} 51 68 38^h

τ **38.0^h** *1* extracted from $4.5^d Te^{119}$
E_ϵ **0.555** *20* scin γ-continuum
$\gamma(Sn^{119})$ **0.02383** *3* L/MN ~3 sm ce
$L_1/L_{23} > 4$ Ml
$\alpha = 6.3$*4 scin xγ/x
(K x ray)(0.024γ) delay = $18.5^{m\mu s}$ *10* scin
(S-capture inner bremsstrahlung γ's)/ϵ_K = 1.06×10^{-4} *15*. The theoretical ratio (Glauber and Martin) is 0.97×10^{-4}
*If no ϵ to g.s. Agreement with theoretical Ml α_L (4.4) supports this assumption.

57D05 J.L.Olsen, L.G.Mann, M.Linder, Phys. Rev. 106, 985 (1957); Bull. Am. Phys. Soc. 1, No. 1, 41 K2 (1956).

Sb^{122} 51 71 2.75^d g.s.

β^+ **0.565** *25*
$\beta^+/\beta^- = 6.46 \times 10^{-5}$ *40*
$\epsilon_K/\beta^+ = 300$ *50* if ϵ(g.s.)/decay = 0.021 *3*

57N31 M.Wolfsberg, J.Welker, M.L.Perlman, Bull. Am. Phys. Soc. 2, No. 1, 24 G6 (1957); verbal report.

Sb^{122} 51 71 2.75^d g.s.

$\gamma(Te^{122})$	(0.564)	E2		$\gamma\gamma(\theta)$
	(0.686)	E2/M1 = (92 ± 4)/(8 ± 4)		
		A_2	A_4	
(0.686 γ)(0.564 γ)(θ)		+0.140 *15*	+0.302 *25*	

J = 2, 2, 0

δ = +3.4 *5*

57L35 T.Lindqvist, I.Marklund, Nuclear Phys. 4, 189 (1957).

Sb^{124} 51 73 61^d g.s.

τ **60.1^d** *5*

From calibration of 2 Sb-Be neutron sources at times separated by 265 days

57J14 C.H.Johnson, A.Galonsky, J.P.Ulrich, Bull. Am. Phys. Soc. 2, No. 4, 177 D2 (1957).

τ **60.9^d** *2* $Sb^{(123)}(n,\gamma)$

Decay followed for 2.5 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\gamma(Te^{124})$

0.2% **2.3** $D(\gamma,n)$

57D48 B.S.Dzhelepov, I.A.Iaritsyna, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 343 (1956); Columbia Tech. Transl. p.314.

β^-	9%	**0.202** *15*	F-K linear	sd
	49%	**0.608** *10*	F-K linear	
	4%	**0.930** *15*	linear F-K assumed	
	10%	**1.590** *10*	F-K linear	
	28%	**2.311** *6*	$\Delta J = 1$, yes shape Not $\Delta J = 2$, yes shape	
$\gamma(Te^{124})$		**0.0077**?*6*	critical scattering	
	194†	**0.603** *1*	α_K = 0.0037 *3* K/LM = 6.1 *5*	sd ce, pe
	12†	**0.646** *1*	α_K = 0.0044 *6*	
	7.5†	**0.714** *2*	α_K = 0.0025 *8*	
	20†	**0.723** *1*	α_K = 0.0027 *4*	
	5†	**0.970** *2*		
	4†	**1.047** *3*		sd pe
	2.5†	**1.298** *4*		
	4†	**1.326** *4*		
	6†	**1.361** *5* **1.370** *4*		
	100†	**1.692** *2*	α_K = 0.00020 *3* K/LM = 4.2 *15*	sd ce, pe
	13†	**2.088** *4*		sd pe
No γ with $0.25 < E_\gamma < 0.45$ (< 0.5%)				sd pe
No ce 0.319γ, ce 0.395γ (< 0.005%)				sd

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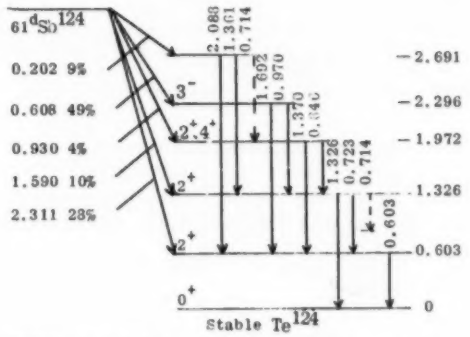
Sb^{124} 51 73 61^d g.s.



56Z06 A.V.Zolotavin, E.P.Grigor'ev, M.A. Abroian, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 289 (1956); Columbia Tech. Transl. p.271.

$\gamma(Te^{124})$			$Sb^{(123)}(n,\gamma)$	
232 *30*†	**0.600**			s Cp
20 *4*†	**0.644**	8.7 *12*†	**1.370**	
37 *5*†	**0.725**	2.6 *6*†	**1.442**	
5.0 *8*†	**0.967**	1.1 *7*†	**1.525?**	
4.8 *18*†	**1.048**	100 †	**1.700**	
4.5 *15*†	**1.330**	14.3 *15*†	**2.090**	

57D53 B.S.Dzhelepov, N.N.Zhukovsky, V.G. Nedovesov, I.F.Uchevatkin, V.G.Chumin, Nuclear Phys. 2, 408 (1957).

$\gamma(Te^{124})$			
	0.602	**0.722**	s ce
	0.645	**0.789**	
	0.708	**1.690**	
	0.713	**2.090**	

56T25 E.P.Tomlinson, Bull. Am. Phys. Soc. 1, No. 7, 329 J6 (1956).

$\gamma(Te^{124})$				s e^+/β^-
(48%)$^\$$	**(1.69)**	α_w = 0.00038*12	E1	
(7%)$^\$$	**(2.09)**	α_w = 0.00057*18	E1	

*Internal pair conversion coefficient found by assuming e^+ spectrum calculated for 0-0 transition**

$^\$$Assumed γ intensity

56D50 B.S.Dzhelepov, O.E.Kraft, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 318 (1956); Columbia Tech. Transl. p.293. **L.N.Zyrianova, V.A.Krutov, Izvest. Akad. Nauk Ser. Fiz. SSSR 20,312(1956); Columbia Tech. Transl.p.288

$\gamma(Te^{124})$	**(1.7)**	pure dipole scin $\gamma\gamma(\theta)$		
	(2.1)	Q/D < 0.01		
		A_2	A_4	
(2.1γ)(0.60γ)(θ)		−0.034 *6*	+0.007 *12*	
J = 3, 2, 0				
(1.7γ)(0.60γ)(θ)		−0.063 *3*	+0.002 *8*	
J = 3, 2, 0				
(~1.38γ)(0.60γ)(θ)		−0.027 *8*	~0.00	
theory [J = 3(D), 2, 0]		−0.071	0	

57L35 T.Lindqvist, I.Marklund, Nuclear Phys. 4, 189 (1957).

Sb^{124} 51 73 61^{d} g.s.

$(E_\beta = 1.8\ 2)(0.6\gamma)(\theta)$ sl β, scin γ
$\eta(\pi) = -0.438\ 27$ 90°, 120°, 150°, 180°

55G67 A.P.Grinberg, I.Kh.Lemberg, Izvest. Nauk Ser. Fiz. SSSR 19, 300 (1955), Columbia Tech. Transl. p.272.

(2.3β)(right circular $0.60\gamma)(\theta)$
$= 1 - (0.13\ 6)\langle v/c \rangle \cos\theta$
γ ray shown to be circularly polarized by forward scattering from magnetized iron

57A59 H.Appel, H.Schopper, Z.Physik 149, 103 (1957).

Sb^{126} 51 75 19^{m}

τ	18.8^{m}	$Te^{(128)}$(28-Mev d, α), $Te^{(126)}$(n,p) chem
β^-		GM
$\gamma(Te^{126})$	**0.42**	scin
	0.65	

Not produced by U(28-Mev d, f)
Mass assignment made by observation of 0.65γ known to be in Te^{126}

56F31 I.Fränz, R.Radicella, J.Rodriguez, Z. Naturf. 11a, 1038 (1956).

Sb^{127} 51 76 88^{h}

τ	88^{h} 2			U(26-Mev d, f)	chem
$\gamma(Te^{127})$ 6†	**0.060** 2				scin
26†	**0.248** *8*	100†	**0.463** *10*		
11†	**0.310** *10*	45†	**0.772** *15*		

57B131 H.Bosch, H.Munczek, Phys. Rev. 106, 983 (1957); Ciencia e invest. (Buenos Aires) 12, 244 (1956).

Sb^{128} 51 77 10^{m}

τ	10.3^{m}	$Te^{(130)}$(28-Mev d, α), $Te^{(128)}$(n,p) chem
$\gamma(Te^{128})$	**0.32**	scin
	0.75	

d 57^{m}Sn from U(28-Mev d, f) chem
Mass assignment made by observation of 0.75γ known from $Te^{128}(\alpha, \alpha'\gamma)$

56F32 I.Fränz J.Rodriguez, R.Radicella, Z. Naturf. 11a, 1037 (1956).

Sb^{128} 51 77 9.6^{h}

τ	9.6^{h}	$Te^{(130)}$(28-Mev d, α), $Te^{(128)}$(n,p) chem
$\gamma(Te^{128})$	**0.32**	scin
	0.75	

Mass assignment made by observation of 0.75γ known from $Te^{128}(\alpha, \alpha'\gamma)$

56F32 I.Fränz, J.Rodriguez, R.Radicella, Z. Naturf. 11a, 1037 (1956).

Te^{120} 52 68

Level	$Te^{120}(\alpha, \alpha'\gamma)$	$E_\alpha = 6.5$
0.560 *6*	$\tau = 10^{\mu\mu s}$ 2	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Te^{122} 52 70

Level	$Te^{122}(\alpha, \alpha'\gamma)$	$E_\alpha = 6.5$
0.570 *6*	$\tau = 10^{\mu\mu s}$ 2	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Te^{124} 52 72

Level	$Te^{124}(\alpha, \alpha'\gamma)$	$E_\alpha = 6.5$
0.608	$\tau = 9^{\mu\mu s}$ *1*	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Te^{126} 52 74

Level	$Te^{126}(\alpha, \alpha'\gamma)$	$E_\alpha = 6.5$
0.662 *7*	$\tau = 7^{\mu\mu s}$ *1*	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Level	$Te^{126}(p, p'\gamma)$	$E_p = 3.0$
0.673	$\tau = 4.5^{\mu\mu s}$ *5*	scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076 p.9 (1956).

Reaction γ's	$Te^{126}(n, n'\gamma)$	$E_n = 4.4$
60†	**0.68** 2	scin
20†	**1.38** 4	

No 0.74γ (<3†)
†Photons/100 0.83γ's from $Te^{130}(n, n'\gamma)$

56S112, R.M.Sinclair, Phys. Rev. 102, 461 (1956); Bull. Am. Phys. Soc. 1, No. 1, 42 K3 (1956).

Te^{128} 52 76

Level	$Te^{128}(\alpha, \alpha'\gamma)$	$E_\alpha = 6.5$
0.750 *8*	$\tau = 4.3^{\mu\mu s}$ *6*	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Level	$Te^{128}(p, p'\gamma)$	$E_p = 3.0$
0.750	$\tau = 3.3^{\mu\mu s}$ 4	scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076 p.9 (1956).

Te^{130} 52 78

Level	$Te^{130}(\alpha, \alpha'\gamma)$	$E_\alpha = 6.5$
0.850 *9*	$\tau = 2.4^{\mu\mu s}$ 4	scin γ

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Level	$Te^{130}(p, p'\gamma)$	$E_p = 3.0$
0.850	$\tau = 2.1^{\mu\mu s}$ 5	scin γ

56S114 P.H.Stelson, F.K.McGowan, ORNL-2076 p.9 (1956).

$_{52}Te^{131}_{79}$ 1.2^{d}

β(ce 0.147γ) delay ~0.1$^{\mu s}$ scin

56G55 T.R.Gerholm, H.deWaard, Arkiv Fysik 11, 110 (1956).

$_{53}I^{125}_{72}$

60^{d} ground state

J	5/2	Mic
μ	+3.0 *10*	
q	−0.66	

57F13 P.Fletcher, E.Amble, Bull. Am. Phys. Soc. 2, No. 1, 30 JA2 (1957); verbal report.

$_{53}I^{126}_{73}$ 13^{d}

I^{127}(17.6-Mev γ,n)

ϵ_K/disintegration = 0.51 *3* 47 scin x/β

57E25 J.Erö, L.Keszthelyi, Nuclear Phys. 2, 371 (1957).

$_{53}I^{127}_{74}$

Ground state

μ_3 +0.181 *47* M

Recalculated from data of V.Jaccarino et al.*; polarization effects not included.

57S28 C.Schwartz, Phys. Rev. 105, 173 (1957); *V.Jaccarino, et al., Phys. Rev. 94, 1798 (1954).

Reaction γ's I^{127}(n,n'γ)

0.065 scin

0.210

No 0.140γ ($\leq$ a few percent of 0.210γ)

56H76 H.Heymann, G.Lindström, H.Neuert, Z. Naturf. 11a, 919 (1956).

Reaction γ's $I^{127}(\alpha,\alpha'\gamma)$

0.060 *2*

0.201 *4*

I^{127}(p,p'γ) E_p = 3.2; scin γ

800†	0.208 *7*	ϵB(E2) = 0.039 *5*
155†	0.392* *8*	
45†	0.438 *10*	ϵB(E2) = 0.006 *1*
245†	0.631 *10*	= 0.116 *14*
76†	0.751 *25*	= 0.074 *9*
9†	0.941* *50*	

*Yield as f(E_p) incompatible with E2 excitation

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Reaction γ's $I^{127}(\alpha,\alpha'\gamma)$ E_α = 3, 6

0.058 0.365 scin

0.200 0.480

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 93, 906 (1954).

$_{53}I^{127}_{74}$

Reaction γ's $I^{127}(N^{14},N^{14\prime}\gamma)$ $E_{N^{14}}$ = 15.6

0.060 *2* scin

0.205 *4*

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl. i Teoret. Fiz. 30, 809 (1956).

$_{53}I^{128}_{75}$

Capture γ's I^{127}(th n,γ)

(Excitation = 6.62 Mev)

32 5† 0.135 *3* scin

Very weak ~ 0.25γ's are possible

Study covered E_γ = 0.05 to 0.50

†Photons/100 I^{127} captures (σ_a = 6.7)

57E28 I.V.Estulin, L.F.Kalinkin, A.S. Melioransky, Nuclear Phys. 4, 91 (1957); Zhur. Eksptl. i Teoret. Fiz. 31, 886 (1955); Soviet Phys. JETP 4, 752 (1957).

Resonances I^{127}(n) chopper

E_0(ev)	Γ_n°(mev)*	E_0(ev)	Γ_n°(mev)*
20.5 *4*	0.24 *5*		
31.4 *6*	2.7 *5*	66 *2*	1.8 *8*
38.1 *9*	5.8 *11*	79 *3*	4.2 *17*
46.0 *12*	3.1 *9*	92 *4*	2.2 *11*

$\overline{\Gamma_n^\circ}$/D 1.9×10^{-4} *6*

*Γ_γ = 100 mev and g = 1/2 were used

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom. Energiya 1, No.5, 55 (1956)

$_{53}I^{131}_{78}$

8.0^{d} ground state

J	7/2	Mic
μ	+2.56 *12*	
q	−0.29	

57F13 P.Fletcher, E.Amble, Bull. Am. Phys. Soc. 2, No. 1, 30 JA2 (1957); verbal report.

$_{53}I^{138}_{85}$ 5.9^{s}

τ 6^{s} U^{235}(n,f) chem

Identified as a delayed-neutron precursor

57P19 G.J.Perlow, A.F.Stehney, Phys. Rev. 107, 776 (1957).

$_{54}Xe$

Reaction γ's Xe($\alpha,\alpha'\gamma$) E_α = 6.5

E_γ	Assigned to A	scin
0.286 *3*	129, 131	
0.364 *4*	129, 131	
0.530 *5*	130	
0.670 *7*	132	
0.870 *9*	134	

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

$Xe^{130}_{54\ 76}$ Level $Xe^{(130)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$ scin γ

0.530 *5*

56H75 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

$Xe^{131}_{54\ 77}$ 12^d $\gamma(Xe^{131})$ **(0.164)** $^a c_{23} = 0.21^*$ *3*

*α (for 5p electrons) calculated from charge distribution of daughter nuclei

57S83 A.H.Snell, A.E.S.Green, ORNL-2302, 3 (1957).
57P37 F.Pleasonton, A.H.Snell, Proc. Roy. Soc. 241A, 141 (1957).

$Xe^{132}_{54\ 78}$ Level $Xe^{(132)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$ scin γ

0.670 *7*

56H75 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

$Xe^{134}_{54\ 80}$ Level $Xe^{(134)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$ scin γ

0.870 *9*

56H75 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 967 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

$Xe^{136}_{54\ 82}$ Resonance $Xe^{135}(n)$

E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)	J
0.0849 *10*	18.2 *5*	94.2 *32*	2

Analysis of the data of Petruska et al.[1], leads to selection of above parameters from the two sets given by Bernstein et al.[2]

56D39 R.W.Deutsch, Phys. Rev. 104, 555 (1956).
[1]Petruska et al., Can. J. Phys. 33, 640 (1955).
[2]Bernstein et al., Phys. Rev. 102, 823 (1956).

$Cs^{127}_{55\ 72}$ 6.3^h ground state $I^{127}(\alpha, 4n)$

J **1/2** M

56N16 W.A.Nierenberg, H.A.Shugart, H.B. Silsbee, R.J.Sunderland, Phys. Rev. 104, 1380 (1956).

6.3^h ground state

J **1/2** M

μ +? **1.43** *2*

57S56 H.B.Silsbee, W.A.Nierenberg, H.A.Shugart, R.J.Sunderland, Bull. Am. Phys. Soc. 2, No. 1, 30 JA1 (1957); verbal report.

$Cs^{129}_{55\ 74}$ 31^h ground state $Xe^{(129)}(p,n)$

J **1/2** M

56N14 W.A.Nierenberg, J.C.Hubbs, H.A. Shugart, H.B.Silsbee, P.O.Strom, Bull. Am. Phys. Soc. 1, No. 7, 343 R3 (1956).

56N16 W.A.Nierenberg, H.A.Shugart, H.B. Silsbee, R.J.Sunderland, Phys. Rev. 104, 1380 (1956).

31^h ground state

J **1/2** M

μ +? **1.47** *2*

57S56 H.B.Silsbee, W.A.Nierenberg, H.A.Shugart, R.J.Sunderland, Bull. Am. Phys. Soc. 2, No. 1, 30 JA1 (1957); verbal report.

$Cs^{130}_{55\ 75}$ 30^m ground state $I^{127}(\alpha,n)$

J **1** M

56N16 W.A.Nierenberg, H.A.Shugart, H.B. Silsbee, R.J.Sunderland, Phys. Rev. 104, 1380 (1956).

$Cs^{131}_{55\ 76}$ 10^d extracted from $11.5^d Ba^{131}$

E_{dis} **0.355** *10* scin γ-continuum

Shape of continuous γ spectrum agrees with predictions of Glauber and Martin*

56H66 D.D.Hoppes, R.W.Hayward, Phys. Rev. 104, 368 (1956); *R.J.Glauber, P.C.Martin, Phys. Rev. 104, 158 (1956).

extracted from $11.5^d Ba^{131}$

E_{dis} **0.360** *15* scin γ-continuum

Continuous γ spectra in coincidence with K x rays has shape predicted by Morrison and Schiff for $E_\gamma > 0.05$

57M63 A.Michalowicz, Ann. Phys. 2, 116 (1957); Compt. rend. 242, 108 (1956).

$Cs^{131}_{55\ 76}$ 10^d ground state $Xe^{(131)}(p,n)$

J **5/2** M

56N14 W.A.Nierenberg, J.C.Hubbs, H.A. Shugart, H.B.Silsbee, P.O.Strom, Bull. Am. Phys. Soc. 1, No. 7, 343 R3 (1956).

$Cs^{132}_{55\ 77}$ 6.2^d $\gamma(Xe^{132})$ Cs^{133}(25-Mev p,pn) chem

100†	**0.670**			scin
	0.77	0.6†	**1.20**	
0.6†	**1.08**	1†	**1.30**	

$(0.670\gamma)(0.77\gamma)$ $(0.670\gamma)(1.30\gamma)$ Σ scin

$(1.08\gamma)(1.20\gamma)$

No $\gamma^{\pm}$ (≤ 2†) No β^- ($\leq 5\%$) scin

56B131 K.S.Bhatki, R.K.Gupta, S.Jha, Nuovo Cim. 4, 1519 (1956).

$Cs^{132}_{55\ 77}$ 6.2^d ground state Xe(132)(p,n)

J 2 M

56N14 W.A.Nierenberg, J.C.Hubbs, H.A. Shugart, H.B.Silsbee, P.O.Strom, Bull. Am. Phys. Soc. 1, No. 7, 343 R3 (1956).

$Cs^{133}_{55\ 78}$ Ground state

q −0.0033 *39* M

56B119 P.Buck, I.I.Rabi, B.Senitzky, Phys. Rev. 104, 553 (1956).

Reaction γ's $Cs^{133}(\alpha,\alpha'\gamma)$ E_α=4.5

0.082 level B(E2) = 0.01 scin

0.082

0.160 level

0.082

0.160

(~0.08γ)(0.082γ)

0.379 level

0.082

0.302

0.379

(0.082γ)(0.302γ)

57F01 L.W.Fagg, Bull. Am. Phys. Soc. 2, No. 4, 207 P2 (1957); verbal report.

Reaction γ's $Cs^{133}(\alpha,\alpha'\gamma)$ E_α=3

0.081 *1* scin

0.163 *2*

56T26 G.M.Temmer, N.P.Heydenburg, Phys. Rev. 104, 967 (1956); 93, 351 (1957).

$Cs^{134}_{55\ 79}$ 2.2^y e.s.

τ 2.07^y *2* Cs^{133}(pile n,γ)

Decay followed for 0.8 half-life ic γ

57G07 K.W.Geiger, Phys. Rev. 105, 1539 (1957).

τ 2.19^y *2* Cs^{133}(pile n,γ) chem

57M47 W.F.Merritt, P.J.Campion, R.C.Hawkings, Can. J. Phys. 35, 16 (1957).

β^-	15.5%	0.077	14%	0.410	sl
	13.5%	0.210	57%	0.663	
$\gamma(Ba^{134})$		0.202		0.800	sl ce
		0.562		1.038	
		0.604		1.179	
		0.795		1.377	

55A54 T.Azuma, Bull. Naniwa Univ. 3A, 237 (1955).

$Cs^{134}_{55\ 79}$ 2.2^y e.s.

$\gamma(Ba^{134})$ 0.5628 *15* cryst

0.56952 *70*

0.60465 *15*

0.79643 *24*

57M02 P.Marmier et al., Cal. Tech. work 1954; priv. comm. via F.Boehm.

$\gamma(Ba^{134})$ 0.460 *20* scin $\gamma\gamma$

0.555 *15*

0.604 *10*

0.794 *15*

1.349 scin

(0.604 γ)(0.460, 0.555, 0.794γ, 1.349γ)

(0.794 γ)(0.555) No (0.794 γ)(0.460γ)

No (1.349 γ)(0.794γ)

56C71 A.Chandra, Proc. Indian Acad. Sci. 44A, 194 (1956).

$Cs^{134}_{55\ 79}$ 2.2^y ground state

μ +2.9729 *9* M

$\mu(Cs^{134})/\mu(Cs^{133})$ = 1.15938 *33*

Used $\mu(Cs^{133})$ = +2.564221 *28*

57S111 H.H.Stroke, V.Jaccarino, D.S.Edmonds, Jr., R.Weiss, Phys. Rev. 105, 590 (1957).

$Cs^{135}_{55\ 80}$ 2.1 x 10^{6y} ground state

μ +2.7134 *3* M

$\mu(Cs^{135})/\mu(Cs^{133})$ = 1.05820 *8*

$\mu(Cs^{137})/\mu(Cs^{135})$ = 1.04005 *8*

Used $\mu(Cs^{133})$ = +2.564221 *28*

57S111 H.H.Stroke, V.Jaccarino, D.S.Edmonds, Jr., R.Weiss, Phys. Rev. 105, 590 (1957).

$Cs^{137}_{55\ 82}$ 27^y

β^-	95.2% *3*	0.51 *1*	ΔJ = 2, yes shape	scin
	4.8% *3*	~1.2	ΔJ = 2, no shape	

57R41 R.A.Ricci, Physica 23, 693 (1957).

β^- 0.540 *10* S77

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955), Columbia Tech. Transl. p.294.

$Cs^{137}_{55\ 82}$ 27^y ground state

μ +2.8219 *3* M

$\mu(Cs^{137})/\mu(Cs^{133})$ = 1.10037 *15*

Used $\mu(Cs^{133})$ = +2.564221 *28*

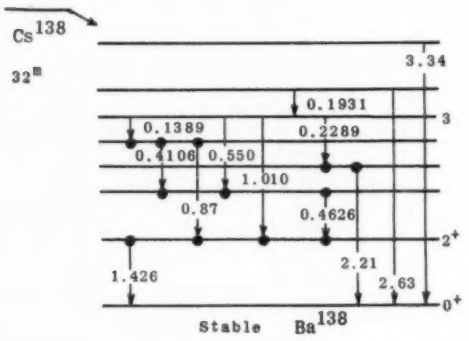
57S111 H.H.Stroke, V.Jaccarino, D.S.Edmonds, Jr., R.Weiss, Phys. Rev. 105, 590 (1957).

$Cs^{138}_{55\ 83}$ 32^m τ **32.1^m** 2 d 17^mXe chem

$\gamma(Ba^{138})$ **0.1134?** scin, sπ ce

2%	**0.1389**	K/L_1 ≥6	
		L_1:L_2:L_3 =4: ≤1: ≤1	
0.8%	**0.1931**		
1.6%	**0.2289**	25%	**1.010** *6*
3%	**0.4106**	73%	**1.426** *5*
23%	**0.4626**	18%	**2.210** *15*
8%	**0.550** *6*	9%	**2.630** *15*
4%	**0.87** *1*	0.5%	**3.34** *4*

(1.426 γ)(0.139, 0.411, 0.463, 0.550, 0.87, 1.010γ) No (1.426 γ)(2.21, 2.63γ)
(0.229 γ)(2.21γ) No γ(2.63γ)
(0.463 γ)(0.139, 0.411, 0.550γ)
(0.139 γ)(0.87γ) No (0.463γ)(1.010γ)
(1.010 γ)(1.426 γ)(θ) J =3, 2, 0



56B101 M.E.Bunker, R.B.Duffield, J.P.Mize, J.W.Starner, Phys. Rev. 103, 1417 (1956); 100, 1236A (1955).

Ba 56 — Relative isotopic abundances ms

Ba^{130}	**0.13%** *2*		
Ba^{132}	**0.19%** *2*	Ba^{136}	**8.07%** *10*
Ba^{134}	**2.60%** *5*	Ba^{137}	**11.87%** *25*
Ba^{135}	**6.73%** *12*	Ba^{138}	**70.41%** *35*

56A50 P.A.Akishin, G.M.Panchenkov, N.N. Vasil'ev, O.T.Nikitin, Zhur. Fiz. Khim. SSSR 30, 1387 (1956); Chem. Abstr. 51-6885f (1957).

$Ba^{130}_{56\ 74}$ Level $Ba^{130}(\alpha,\alpha'\gamma)$ E_α =4.6

0.359 τ =65$^{\mu\mu s}$ scin γ

57P01 L.W.Fagg, Bull. Am. Phys. Soc. 2, No. 4, 207 P2 (1957); verbal report.

$Ba^{131}_{56\ 75}$ 11.5^d τ **12.0^d** $Ba^{(130)}(n,\gamma)$ chem

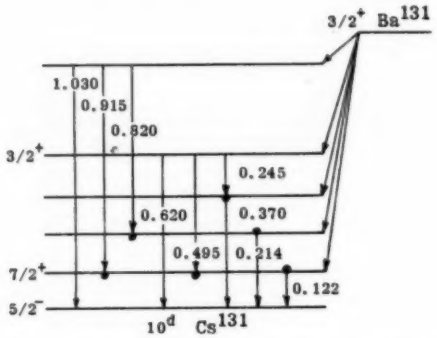
Decay followed for 4 half-lives scin γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$Ba^{131}_{56\ 75}$ 11.5^d $\gamma(Cs^{131})$ **~0.083?** scin

0.122	α_K = 0.39 *4*		
0.214		**0.620**	
0.245		**0.820**	
0.370		**0.915**	
0.495		**1.030**	

(0.122 γ)(0.495, 0.915γ) (0.214 γ)(0.820γ)
(0.245 γ)(0.370γ) No γ(~0.083γ)
(K x ray)(0.214, 0.245, 0.370γ) delay < $1^{m\mu s}$

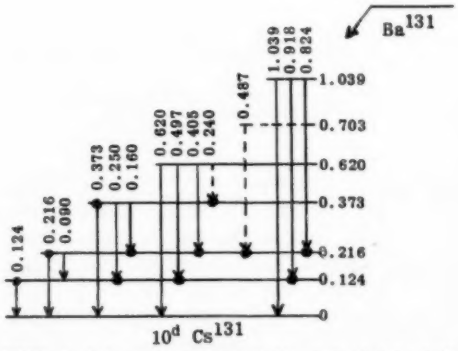


56V21 H.Vartapetian, Compt. rend. 243, 1512 (1956).

$Ba^{130}(n,\gamma)$

$\gamma(Cs^{131})$ 7†	**0.090**		sd ce; scin γ, γγ
73†	**(0.124)**		
	0.133	100†	**(0.497)**
~4†	**0.160***	4†	**0.588**
55†	**(0.216)**	3†	**0.620**
10†	**0.240**		**0.680?**
11†	**0.250**		**0.750?**
36†	**(0.373)**	0.8†	**0.824**
5†	**0.405**	0.2†	**0.918**
	0.487**		**1.039**

(0.124γ)(0.160, 0.250, 0.497, 0.824, 0.918γ)
(0.216γ)(0.160, 0.405, 0.487, 0.824γ)
(~0.25γ)(0.124, 0.373γ)
*No ce 0.160γ observed **In γγ only



57A73 L.S.August, R.W.Campbell, M.Goodrich, Bull. Am. Phys. Soc. 2, No. 4, 231 W2 (1957); verbal report.

$Ba^{132}_{56\ 76}$ Level $Ba^{132}(\alpha,\alpha'\gamma)$ E_α = 5.1
0.470 τ = 17 μμs scin γ

57F01 L.W.Fagg, Bull. Am. Phys. Soc. 2, No. 4, 207 P2 (1957); verbal report.

$Ba^{133}_{56\ 77}$ τ **7.5**^{y}
7.5^y g.s.

56K52 S.Katcoff, quoted by W.C.Beggs, B.L. Robinson, R.W.Fink, Phys. Rev. 101, 149 (1956).

$\gamma(Cs^{133})$ **(0.082)** α = 2.6 scin

57B139 A.J.Bureau, C.L.Hammer, Phys. Rev. 105, 1006 (1957).

$Ba^{135}_{56\ 79}$ Reaction γ $Ba^{135}(\alpha,\alpha'\gamma)$ E_α = 4.4
0.214 B(E2) = 0.0051 scin

57F01 L.W.Fagg, Bull. Am. Phys. Soc. 2, No. 4, 207 P2 (1957); verbal report.

$Ba^{137}_{56\ 81}$ 2.6^m $\gamma(Ba^{137})$ **0.661** *2* 27^{y}Cs source
α_K = 0.11 *1* M4 sπ ce
K/L = 6.0 *1* L/M = 4.1 *4*

55D43 G.M.Drabkin, V.I.Orlov, L.I.Rusinov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 324 (1955); Columbia Tech. Transl. p.293.

$\gamma(Ba^{137})$ 27^{y}Cs^{137} source
(0.662) α = 0.114 *22* scin ce/β

57R41 R.A.Ricci, Physica 23, 693 (1957).

$\gamma(Ba^{137})$ **(0.662)** 27^{y}Cs source
K:L:M = 590 *10*:100:28 *2*
sπ ce

56A48 I.A.Antonova, Zhur. Eksptl.' i Teoret. Fiz. 30, 571 (1956); Soviet Phys. JETP 3, 461 (1956).

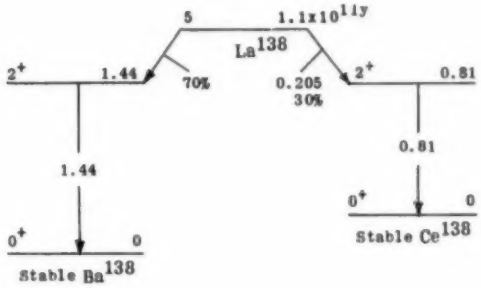
$Ba^{137}_{56\ 81}$ Reaction γ $Ba^{137}(\alpha,\alpha'\gamma)$ E_α = 4.4
0.281 B(E2) = 0.013 scin

57F01 L.W.Fagg, Bull. Am. Phys. Soc. 2, No. 4, 207 P2 (1957); verbal report.

$Ba^{139}_{56\ 83}$ 85^m $\gamma(La^{139})$ $Ba^{(138)}$(0.025-Mev n,γ)
23† **(0.166)** scin
†Photons per 100 disintegrations

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$La^{138}_{57\ 81}$ 1.1x10^{11y} τ_ϵ **1.64 x10^{11y}** *6* Natural La
τ_β **3.5 x10^{11y}** *3*
β^- **0.205** *10* pc
$\gamma(Ba^{138})$ **1.44** *2* scin
$\gamma(Ce^{138})$ **0.81** *1*
1.44γ/sec g La = 0.515 *20* if γ/sec g K = 3.47
0.81γ/sec g La = 0.243 *20*
No β^+ (< 1%) scin $\gamma^\pm,\gamma^\pm\gamma$
No 1.0β (≤1.5%) No 0.535γ
(1.44γ)(K x ray) No (0.81γ)(1.44γ, K x ray)



57G20 R.N.Glover, D.E.Walt, Phil. Mag. 2, 49 (1957).

$La^{139}_{57\ 82}$ Ground state
q **+0.3** *1* S
Recalculated from previous data*

57M96 K.Murakawa, T.Kamei, Phys. Rev. 105, 671 (1957); *K.Murakawa, Phys. Rev. 98, 1285 (1955).

$La^{140}_{57\ 83}$ 40^h $\gamma(Ce^{140})$ $La^{(139)}$(pile n,γ)
sπ Cp

18†	**0.335**		
39†	**0.482**	94†	**1.597**
35†	**0.822**	5.5†	**2.535**
11†	**0.918**	<0.2†	**>2.700**

†Photons/100 disintegrations

55A45 L.V.Arkhangel'skiĭ, B.S.Dzhelepov, N.N.Zhukovskiĭ, V.P.Prikhodtseva, Yu. V. Khol'nov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 251 (1955), Columbia Tech. Transl. p.228.

$\gamma(Ce^{140})$ $La^{(139)}$(0.025-Mev n,γ)
88.2% **(1.60)** scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$(E_\beta > 1.67)(1.60\gamma)(\theta)$ $\eta(\pi)$ = 0.133 *16* scin

55J29 E.N.Jensen, ISC-707, 9 (1955).

Ce 58

Relative isotopic abundances ms
No Ce^{134}, Ce^{137} ($<1.5 \times 10^{-4}$%)
No Ce^{135} ($<6 \times 10^{-5}$%)
No Ce^{139} ($<2 \times 10^{-3}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Ce^{141} 58 83 33^d

$Ce^{(140)}$(pile n,γ)

β^-	67†	0.447	sl
	33†	0.591	
x		K x ray	scin
$\gamma(Pr^{141})$		0.145	$\alpha_K = 0.37$ M1 scin x/γ
			$\alpha_{LM} = 0.06$ sl ce_{LM}/β

57Z03 G.B.Zorzoli, Nuovo Cim. 5, 289 (1957).

Ce^{142} 58 84

τ_α $\sim 5 \times 10^{15}$y
α 1.5 ppl
75 tracks of range of $\sim 5\mu$ observed from Ce^{142} This group not found with Ce^{140}

57R43 W.Riezler, G.Kauw, Z.Naturf. 12a, 665 (1957).

Ce^{143} 58 85 33^h

$\gamma(Pr^{143})$ $Ce^{(142)}$(0.025-Mev n,γ)
42.6† (0.294) scin
†Photons per 100 disintegrations

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

Ce^{144} 58 86 284^d

τ 284.5^d *10* U(n,f) chem

56S87 R.P.Schuman, M.E.Jones, A.C.Mewherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

τ 285^d *2* U(n,f) chem

57M47 W.F.Merritt, P.J.Campion, R.C.Hawkings, Can. J. Phys. 35, 16 (1957).

Pr 59

Relative isotopic abundances ms
Pr^{141} 100%
No Pr^{138}, Pr^{144} ($<2 \times 10^{-4}$%)
No Pr^{139} ($<4 \times 10^{-4}$%)
No Pr^{140}, Pr^{142} ($<2 \times 10^{-3}$%)
No Pr^{143} ($<8 \times 10^{-4}$%) No Pr^{145} ($<5 \times 10^{-5}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Pr^{141} 59 82

Level $Pr^{141}(\gamma,\gamma)$
(0.145) $\tau = 2.0^{m}\mu s$ *3*
E2/M1 < 0.06 for 0.145γ $\gamma\gamma(\theta)$
τ(half-life) is average of result of heating and rotating Ce^{141} source to compensate for recoil and calc. using $\alpha = 0.26$ for 0.145γ

56M76 F.R.Metzger, J. Franklin Inst. 261, 219 (1956); Phys. Rev. 99, 613A (1955).

Pr^{142} 59 83 19^h

$\gamma(Nd^{142})$ Pr^{141}(0.025-Mev n,γ)
4.1% (1.57) scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$(0.4 < E_\beta < 0.5)(1.57\gamma)(\theta)$ $\eta(\pi) = -0.058$ *14* scin

55J29 E.N.Jensen, ISC-707, 9 (1955).

Pr^{143} 59 84 14^d

τ 13.76^d *5* U(n,f) chem
Decay followed for 2.2 half-lives GM

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

Pr^{144} 59 85 17.5^m

$284^d Ce^{144}$ source

β^-	2.28	scin $\beta\gamma$
	2.99	sl

If $J = 0^-$ for Pr^{144}g.s., $G_T/G_p \sim 0.01$ required to explain shape of 2.99 β

56L39 M.J.Laubitz, Proc. Phys. Soc. 69A, 789 (1956).

β^- longitudinal polarization

−0.66 *18*	[E_β = 0.4 to 1.1 ($<v/c> = 0.86$)
−1.05 *25*	[E_β = 1.2 to 3.0 ($<v/c> = 0.97$)

More spins antiparallel to direction of motion
Measured Møller scattering of β's by magnetized Deltamax foil scin ee

57H26 H.Frauenfelder, A.O.Hanson, N.Levine, A.Rossi, G.DePasquali, Phys. Rev. 107, 643 (1957).

Nd^{144} 60 84

Resonances Nd^{143}(n,γ) E_n = 16 to 2600 ev
(Excitation = 7.9) pulsed n's
56 *1* ev scin
128 *4*
158* *5*
180 *6*
*Also observed in Nd^{149}

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

Nd^{146} 60 86

Resonances Nd^{145}(n,γ) E_n = 16 to 2600 ev
(Excitation = 7.5) pulsed n's
43.5 *9* ev scin
83 *2*
105 *3*
236* *9*
*Also observed in Nd^{151}

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$_{60}Nd^{147}_{87}$ $_{11^d}$

τ	**11.06^d** 4	U(n,f)	chem
Decay followed for 6.3 half-lives			ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

		δ	E2/M1	
γ(Pm^{147})	**(0.09)**	−0.17 *15*	0.03	$\gamma(L,T)$
	(0.53)	+0.75 *25*	0.56	$\gamma(\theta,T)$

Ground state

$\lvert\mu\rvert$	**≥0.44** *6* (if J = 9/2)		$\gamma(\theta,T)$

57B86 G.R.Bishop, M.A.Grace, C.E.Johnson, H.R.Lemmer, J.Perez y Jorba, Phil. Mag. 2, 534 (1957).

$_{60}Nd^{149}_{89}$

Resonances	Nd^{148}(n,γ)	E_n = 16 to 2600 ev	
	(Excitation = 5.2)	pulsed n's	
	158* *5* ev		scin
	290 *13*		

*Also observed in Nd^{144}

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$_{60}Nd^{151}_{91}$

Resonances	Nd^{150}(n,γ)	E_n = 16 to 2600 ev	
	(Excitation = ~4.3)	pulsed n's	
	236* *9* ev		scin
	375 *19*		

*Also observed in Nd^{146}

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$_{61}Pm^{147}_{86}$ $_{2.6^y}$

τ	**2.66^y** 2	U(n,f)	chem
Not corrected for ~1% $1.7^y Eu^{155}$			

56S87 R.P.Schuman, W.E.Jones, A.C.Mewherter, J. Inorg. Nucl. Chem. 3, 160 (1956).

τ	**2.64^y** 2	

57M47 W.F.Merritt, P.J.Campion, R.C.Hawkings, Can. J. Phys. 35, 16 (1957).

β^-	**0.218** *5*	sl

56N21 T.D.Nainan, H.G.Deware, A.Mukerji, Proc. Indian Acad. Sci. 44A, 111 (1956).

γ(Sm^{147})	**(0.121)**	carrier-free source
3.4×10^{-5} 5 photons/β observed in study of inner bremsstrahlung intensity		

57S105 N.Starfelt, J.Cederlund, Phys. Rev. 105, 241 (1957).

$_{62}Sm$

Relative isotopic abundances ms

Sm^{144}	**3.02%** *2*		
Sm^{147}	**14.87%** *4*	Sm^{150}	**7.40%** *2*
Sm^{148}	**11.22%** *3*	Sm^{152}	**26.80%** *5*
Sm^{149}	**13.82%** *4*	Sm^{154}	**22.88%** *6*

57A22 K.L.Aitken, D.J.Littler, E.E.Lockett, G.H.Palmer, J. Nuclear Energy 4, 33 (1957).

Relative isotopic abundances ms

Sm^{144}	**3.15%** *3*		
Sm^{147}	**15.09%** *10*	Sm^{150}	**7.47%** *6*
Sm^{148}	**11.33%** *9*	Sm^{152}	**26.55%** *20*
Sm^{149}	**13.96%** *10*	Sm^{154}	**22.43%** *20*

No Sm^{140} ($<2 \times 10^{-5}$%) No Sm^{141} ($<3 \times 10^{-4}$%)
No Sm^{142} ($<1 \times 10^{-4}$%) No Sm^{143} ($<6 \times 10^{-5}$%)
No Sm^{145} ($<5 \times 10^{-5}$%) No Sm^{146} ($<8 \times 10^{-5}$%)
No Sm^{151}, Sm^{153} ($<2 \times 10^{-4}$%)
No Sm^{155} ($<2 \times 10^{-3}$%) No Sm^{156} ($<4 \times 10^{-4}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

$_{62}Sm^{145}_{83}$ $_{\sim 240^d}$

τ	**~240^d**	Sm^{144}(pile n)	
γ(Pm^{145})	**0.0613**	cryst,scin	
x	Pm $K_{\alpha 1}$,$K_{\alpha 2}$,$K_{\beta 1}$,$K_{\beta 2}$ x rays		
(0.061γ)(K x ray)	(K x ray)(K x ray)		
No β^-, no β^+, no α, no other γ			

57C01 G.W.Callendine,Jr., W.E.Carey, M.L.Pool, Bull. Am. Phys. Soc. 2, No. 1, 24 G8 (1957); verbal report.

$_{62}Sm^{147}_{85}$ $_{1.25 \times 10^{11}y}$

τ	**1.15×10^{11}y** *3*	natural Sm	
α	**2.18** *14*	ppl	
Plate loaded with Sm_2O_3 in C_2H_5OH. Facing plate corrected for escape.			

54L55 G.E.Leslie, Thesis North Carolina State College; AD-37749 (1954). NSA 10, #1099 (1956).

$_{62}Sm^{148}_{86}$

Resonances Sm^{147}(n) E_n = 10 to 100 ev
(Excitation = 8.2 Mev) chopper

E_o(ev)	$g\Gamma_n$ (mev)	Γ_γ(mev)
18.3?	35.7 *36*	41 *17*
27.0	1.95 *27*	46 *45*
32.0	14.2 *14*	55 *15*

9 additional resonances from 29 to 99 ev

$\bar{\Gamma}_n^o$	**6.1** *10* mev
$\bar{D}$	**14.3** *26* ev
$\bar{\Gamma}_n^o/D$	**4.2×10^{-4}** *10*

57S57 F.B.Simpson, R.G.Fluharty, Bull. Am. Phys. Soc. 2, No. 1, 42 NA7 (1957); verbal report.

$_{62}Sm^{150}_{88}$

Capture γ's $Sm^{(149)}$(th n,γ)
(Excitation = 8.4 Mev)

70 *10*†	**0.338** *4*		scin
34 *5*†	**0.442** *5*		

Study covered E_γ = 0.05 to 0.50
†Photons/100 Sm captures (σ_a[Sm^{149}] = 66200)
(Max in Sm^{150} ~ 100†)

57E31 I.V.Estulin, L.P.Kalinkin, A.S. Melioransky, Nuclear Phys. 4, 91 (1957).

$Sm^{150}_{62\ 88}$

Resonances $Sm^{149}(n)$ E_n = 0.1 to 20 ev (Excitation = 8.0 Mev) chopper

E_o(ev)	$2g\Gamma_n^o$(mev)
(0.096)	2.04 *15*
0.89	0.83 *17*
5.04	0.92 *23*
6.57	0.45 *11*
9.19	4.9 *13*
12.4	0.56 *17*

Γ_γ = 65 mev was used

$\frac{D}{\Gamma_n^o}$ **3.6** *12* ev

$\frac{\Gamma_n^o}{D}$ **3.3 x 10^{-4}** *14*

57B103 R.C.Block, G.G.Slaughter, J.A.Harvey, Bull. Am. Phys. Soc. 2, No. 4, 218 S9 (1957); verbal report.

Resonances $Sm^{149}(n)$ E_n = 10 to 100 ev (Excitation = 8.0 Mev) chopper

23 resonances

$\frac{\Gamma_n^o}{}$ **4.5** *5* mev

$\frac{D}{}$ **6.6** *12* ev

$\frac{\Gamma_n^o}{D}$ **6.8 x 10^{-4}** *20*

57S57 F.B.Simpson, R.G.Fluharty, Bull. Am. Phys. Soc. 2, No. 1, 42 NA7 (1957); verbal report.

$Sm^{151}_{62\ 89}$ $\sim 93^y$

β^- **0.075** sl

$\gamma(Eu^{151})$ **0.0216** α_L = 21 M1 L/MN = 3 [sl ce, scin γ

$ce_L(0.0216\gamma)/\beta$ = 0.012

57A09 W.T.Achor, W.E.Phillips, J.I.Hopkins, S.K.Haynes, Bull. Am. Phys. Soc. 2, No. 5, 259 B2 (1957); priv. comm.

$Sm^{152}_{62\ 90}$

0.122 level Sm^{152}(2.1-Mev p,p'γ)

$|\mu|$ **0.72** *1* p,$\gamma(\theta,H)$

Used $\tau = 1.37^{m\mu s}$

57S16 R.P.Scharenberg, G.Goldring, Bull. Am. Phys. Soc. 2, No. 1, 69 XA6 (1957); verbal report.

Level $Sm^{(152)}(\gamma,\gamma)$ Eu^{152} γ source

(0.976) $\tau = 12^{m\mu\mu s}$ *2*

56G48 L.Grodzins, Bull. Am. Phys. Soc. 1, No. 7, 329 J7 (1956); verbal report.

Resonances $Sm^{151}(n)$ E_n = 0.2 to 20 ev (Excitation = 8.4 Mev) chopper

E_o(ev)	$2g\Gamma_n^o$(mev)
1.10	0.58 *12*
1.70	0.20 *7*
2.04	0.34 *9*
4.10	0.25 *8*
6.30	1.3 *4*

Γ_γ = 65 mev was used

$\frac{D}{}$ **2.1** *8* ev

$\frac{\Gamma_n^o}{D}$ **2.2 x 10^{-4}** *10*

57B103 R.C.Block, G.G.Slaughter, J.A.Harvey, Bull. Am. Phys. Soc. 2, No. 4, 218 S9 (1957); verbal report.

$Sm^{153}_{62\ 91}$ 47^h

β^- ~0.06% **0.13** 38% **0.720** *10* scin

40% **0.645** *10* 22% **0.825** *10*

$\gamma(Eu^{153})$

25† **0.070** α_K = 4.4 *4* scin γ,γx/$\gamma\gamma$

100† **0.100** α_K = 1.19 *15* γ,x/γ

0.073† **0.170** scin

0.15† **0.53**

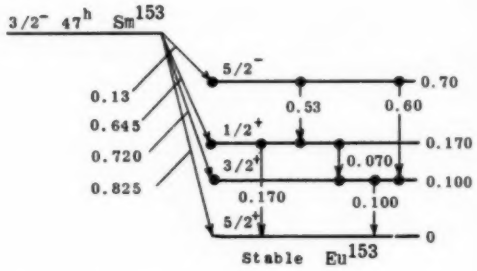
0.036† **0.60**

(0.13 β)(0.53, 0.60γ)

(0.645 β)(0.070, 0.170γ) (0.720 β)(0.100γ)

(0.070 γ)(0.100, 0.53γ) (0.100 γ)(0.53, 0.60γ)

No (0.825 β)γ No (0.070 γ)(0.60γ)



56D31 V.S.Dubey, C.E.Mandeville, M.A. Rothman, Phys. Rev. 103, 1430 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 B12 (1956).

$\beta(0.070\gamma)$ delay < $1^{m\mu s}$ scin

$(0.070\gamma)(0.100\gamma)$ delay = $4.0^{m\mu s}$ *2*

56V19 M.Vergnes, N.Marty, J. phys. radium 17, 908 (1956).

$Sm^{155}_{62\ 93}$ 24^m

$\gamma(Eu^{155})$ $Sm^{(154)}$(0.025-Mev n,γ)

3.7† **(0.25)** scin

†Photons per 100 disintegrations

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

Eu 63

Relative isotopic abundances ms

Eu^{151} **47.86%** *8*

Eu^{153} **52.14%** *8*

No Eu^{147}, Eu^{149}, Eu^{150} (< 1 x 10^{-4}%)

No Eu^{148}, Eu^{152}, Eu^{154} (< 2 x 10^{-4}%)

No Eu^{155} (< 1 x 10^{-3}%) No Eu^{156} (< 8 x 10^{-4}%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

$Eu^{151}_{63\ 88}$

Ground state

$\mu(Eu^{151})/\mu(Eu^{153})$ = + **2.24** *3* para

56M99 A.A.Manenkov, A.M.Prokhorov, Doklady Akad. Nauk SSSR 107, 402 (1956); Soviet Phys. Doklady 1, 196 (1956).

Eu^{151} 63 88

Reaction γ's $Eu^{151}(p,p'\gamma)$ E_p = 2 to 4
$Eu^{151}(\alpha,\alpha'\gamma)$ E_α = 3.7

			s ce
	0.195 level		
≤0.020*	**0.193**	2	
	0.304 level		
	0.111?		
	0.193?		
0.0031*	**0.284**	3	K/L > 5
0.021*	**0.304**	3	K/L ~ 6.5

*$\epsilon B(E2)$ for ce_k

57C44 C.M.Class, U.Meyer-Berkhout, Nuclear Phys. 3, 656 (1957).

Reaction γ's $Eu^{151}(\alpha,\alpha'\gamma)$ E_α = 6

0.195 level		B(E2) = 0.05 2	scin γ
	0.195	2	
0.304 level		B(E2) = 0.28 9	
	0.110	1	
10†	**0.195**	2	
90†	**0.304**	3	

(0.110 γ)(0.195 γ)

56H75 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955); Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Eu^{152} 63 89 13^y g.s.

τ **12.2^y** 2 $Eu^{(151)}$(pile n,γ)
Decay followed for 0.4 half-life ic γ

57G07 K.W.Geiger, Phys. Rev. 105, 1539 (1957).

Spectroscopically pure Eu(pile n,γ)
Assignments of β's and γ's to Eu^{152} and Eu^{154} from coincidence data below and work of others with enriched materials

β^-	10.8%	**0.720**	25	scin, s (0.775γ)β
	1.1%	**0.950**	50	(~0.420γ)β
	15.1%	**1.515**	30	(0.344γ)β
ϵ	73 %			F-K linear (E_β > 0.75)

β^- and ϵ intensities from photon intensities, conversion coefficients, and decay scheme

			α_K*	s ce, scin
$\gamma(Sm^{152})$				
~150†	**0.122**	1	0.58	K: L: M = E2
			1.66: 1: 0.24	
40†	**0.244**	2	0.61	K/LM ~ 3.4 E2
40†	**0.752**	8	0.0018	E1
15†	**0.862**	9	0.0046	M1
60†	**0.963**	10		
	1.002	10		
~25†	**1.079**	11	~0.0013	E2?
~25†	**1.103**	11	~0.0026	M1?
~20†	**1.200**	12	<0.00045 ($\gamma\gamma$ only)	E1?
90†	**1.415**	14	0.00047	
$\gamma(Gd^{152})$				
100†	**0.344**	3	(0.03 theoretical)	E2
~4†	**0.410**	4	0.0016	E1
40†	**0.775**	8	0.0011	E1

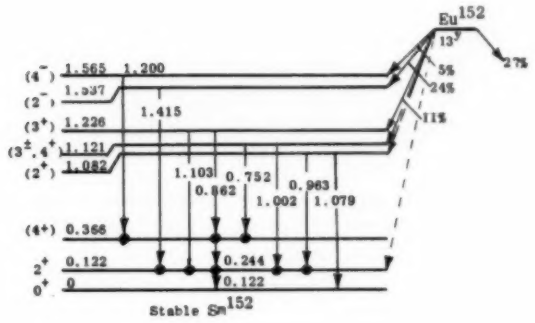
*Based on theoretical E2 value for 0.344γ
γ(Assignment doubtful, one ce line only):
0.442, 0.478, 0.578, 0.611, 0.656, 0.688 if line is $ce_K(Sm^{152})$

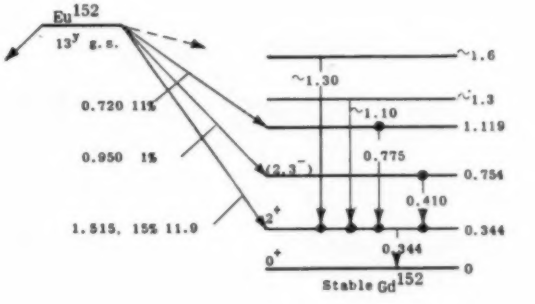
Continued

Eu^{152} 63 89 13^y g.s.

Continued

(K x ray)(0.122, 0.244, ~0.850, 0.965, 1.090, 1.415γ)
(0.122 + 0.123γ)(K x ray, 0.244$^\$$, ~0.450$^\$$, ~0.600$^{\$\$}$, ~0.700$^\$$ 0.860, 0.965, ~1.00$^{\$\$}$, ~1.10$^\$$, 1.415$^\$\gamma$)
(0.244 γ)(K x ray, 0.122$^\$$, ~0.750$^\$$, 0.860$^\$$, 1.200$^\$\gamma$)
(0.344 γ)(~0.420$^\$$, 0.78$^\$$, ~1.10, ~1.30γ)
(0.750 γ)(K x ray, 0.122, 0.244, 0.344? γ)
(0.775 γ)(0.344γ)
(0.860 γ)(K x ray, 0.122, 0.244γ)
(~1.09 γ)(K x ray, 0.122γ)
(1.200 γ)(K x ray, 0.122, 0.244γ)
(1.415 γ)(K x ray, 0.122γ)
$^\$$Found also in (ce)(γ). $^{\$\$}$Found only in (ce)($\gamma$)





57N01 O.Nathan, N.A.Waggoner, Nuclear Phys. 2, 548 (1957).

$Eu^{(151)}$(n,γ)

$\gamma(Sm^{152})$	(0.122)	K/L = 1.76 4	s ce
		L/M = 4.5 1	
		$L_1:L_2:L_3$ = 100: 222 4: 216 5	
		$M_1:M_2:M_3$ = 10: 34 1: 33 2	

57K08 V.M.Kelman, V.A.Romanov, R.Y. Metskhvarishvili, V.A.Kolyunov, Nuclear Phys. 2, 395 (1957).

$\gamma(Sm^{152})$	**0.12179**	cryst
	0.24484	

56B123 F.Boehm, E.N.Hatch, Bull. Am. Phys. Soc. 1, No. 8, 390 M7 (1956); verbal report.

Eu^{152} 63 89 9.2^h

Spectroscopically pure Eu(pile n,γ)

β^-	3.6%	**0.56**	5	scin, sl (0.980, 1.32γ)β
	1.6%	**1.55**	5	(0.344γ)β
	70 %	**1.89**	2	sl
ϵ	25 %			

β^- and ϵ intensities from photon intensities, conversion coefficients, decay scheme

$\gamma(Sm^{152})$		α_K^*	sl ce, scin
270†	**0.122** 1		
390†	**0.837** 8	0.0016	E1
400†	**0.961** 10	0.0011	E1
~70†	**1.415** 20		
$\gamma(Gd^{152})$			
100†	**0.344** 3	(0.03 theoretical)	E2
~40†	**0.980** 10		
~100†	**1.32** 2		

No (1.89β)γ

(K x ray)(0.122, 0.837 ,0.96, 1.415 γ) scin

(0.344γ)(0.980γ) No γ(1.32γ)

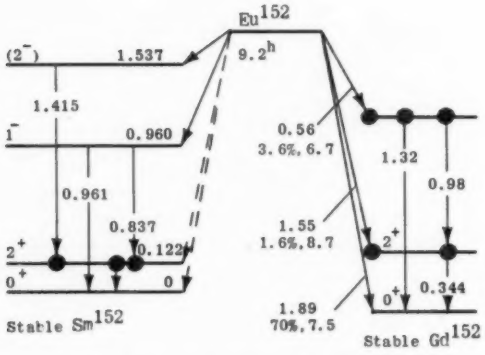
(0.122γ)(0.837$^\$$, 1.415$\gamma^\$$) scin, (sl ce)(scinγ)

0.344γ/β = 0.035 5

*Based on theoretical E2 value for 0.344γ

No ce's with $0.925 < E_{ce} < 1.400$

$^\$$Found also in (ce)(γ)



57N01 O.Nathan, M.A.Waggoner, Nuclear Phys. 2, 548 (1957).

(0.854γ)(0.122γ)(θ) J = 1, 2, 0 scin

56G48 L.Grodzins, Bull. Am. Phys. Soc. 1, No. 7, 329 (1956); verbal report.

Eu^{152} 63 89

13^y Ground state

J 3 para

$|\mu|$ 2.03

$|\mu(Eu^{151})|/|\mu(Eu^{152})| = 1.77$ 2

57M19 A.A.Manenkov, A.M.Prokhorov, P.S. Trukhlayev, G.N.Yakovlev, Dokaldy Akad. Nauk SSSR 112, 623 (1957).

Eu^{152} 63 89

Resonance $Eu^{(151)}(n)$

E_o(ev)	Γ_γ(mev)	
3.72	69 7	cryst

Isotope assignment by use of enriched Eu^{151*}

56L34 H.H.Landon, Bull. Am. Phys. Soc. 1, No. 7, 347 X9 (1956); *J.A.Harvey, ibid.

Eu^{153} 63 90

Levels $Eu^{(153)}(p,p'\gamma)$ E_p = 2.5, 2.9

[B(E2) 0.187 level]/[B(E2) 0.082 level] = 0.225

From 0.105γ/0.082γ = 0.0465 30,

0.187γ/0.105γ = 1.30 2

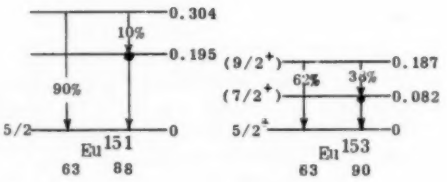
assuming α(M1) = 0.8 of Rose's calc. value

56G47 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314 (1956); priv. comm.

Reaction γ's $Eu^{153}(\alpha,\alpha'\gamma)$ E_α = 6

0.082 level	B(E2) = 2.8 9	scin γ
0.082 1		
0.187 level	B(E2) = 0.8 2	
0.082 1		
100† **0.105** 1		
162† **0.187** 2		

(0.105γ)(0.082γ)



56H79 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955); Bull. Am. Phys. Soc. 1, No. 1, 43 K11 (1956).

Reaction γ's $Eu^{153}(\alpha,\alpha'\gamma)$ E_α = 2 to 4

0.082 level			s ce
~0.8*	**0.083** 1	K/L~1	
0.187 level			
	0.083 1		
0.090*	**0.107** 1	K/L~2.2	
0.045*	**0.190** 2	K/L = 3.2	

*ϵB(E2) for ce_K

57C44 C.M.Class, U.Meyer-Berkhout, Nuclear Phys. 3, 656 (1957).

Reaction γ's $Eu^{(153)}(\alpha,\alpha'\gamma)$ E_α = 4

	K/L	E2/M1*	α*	
0.084	1.7 2	0.48	3.6	s ce
0.111	5.6 8	0.08	1.2	

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

Eu^{154} 63 91 16^y

Spectroscopically pure Eu(pile n,γ)

β^-	0.35 *10*	scin,sl	(0.244γ)β
	0.58 *5*		(1.28 γ)β
	0.75 *5*		(~0.580γ)β
	0.95 *5*		(~1.03γ)β
	1.85 *2*		sl
γ(Gd^{154})			sl ce, scin
	0.123 *1*	K:L:M = 1.66:1:0.24	E2
	1.280	$\alpha_K < 7.5\times10^{-4}$*	E1?

(1.85β)(0.123γ only)
No ce with $10 < E_{ce} < 100$ kev other than ce(0.128γ)
(ce_K 0.123γ)(~0.710, ~0.880, ~0.980, ~1.280γ)
*Based on theoretical E2 value for Eu^{152} 0.344γ

57N01 O.Nathan, M.A.Waggoner, Nuclear Phys. 2, 548 (1957).

$Eu^{(153)}$(n,γ)

γ(Gd^{154})	(0.123)	K/L = 1.51 *3*	prism-s ce
		$L_1:L_2:L_3$ = 100:269 *8*:246 *6*	

57K08 V.M.Kelman, V.A.Romanov, R.Y. Metskhvarishvili, V.A.Kolyunov, Nuclear Phys. 2, 395 (1957).

γ(Gd^{154})	0.12307	cryst
	0.24808	

56B123 F.Boehm, E.N.Hatch, Bull. Am. Phys. Soc. 1, No. 8, 390 M7 (1956); verbal report.

Eu^{154} 63 91

16^y ground state — Eu^{153}(pile n,γ)

J 3 para

$|\mu(Eu^{154})/\mu(Eu^{153})| = 1.308$ *4*

56K35 R.W.Kedzie, M.Abraham, C.D.Jeffries, Bull. Am. Phys. Soc. 1, No. 8, 390 M11 (1956).

Resonances $Eu^{(153)}$(n)

E_o(ev)	Γ_γ(mev)	
2.455	89 *2*	cryst
3.94	91 *5*	

Isotope assignment by use of enriched Eu^{153}*

56L34 H.H.Landon, Bull. Am. Phys. Soc. 1, No. 7, 347 X9 (1956); *J.A.Harvey, ibid.

$Eu^{152,154}$ 63

Eu(n,γ)

β^-		0.75 *8*		scin	(0.340γ)β
		1.46 *15*			(0.340γ)β
γ	50†	0.084 *3*	125†	0.77 *2*	
	185†	0.124 *4*	60†	~0.87	
	100†	0.244 *7*	190†	0.97 *3*	
	220†	0.340 *10*	190†	1.09 *3*	
	15†	~0.41	55†	~1.26	
	35†	~0.71	200†	1.41 *4*	

(K x ray)(0.084, 0.124, 0.244, 0.340, 0.77, 0.87, 0.97, 1.09, 1.26, 1.41γ)
(0.124γ)(K x ray, 0.124, 0.244, 0.340, 0.71, 1.41γ)
(0.244γ)(K x ray, 0.124, 0.340, 0.71, 0.87, 1.41γ)

continued

460722 O - 58 - 7

$Eu^{152,154}$ 63

continued

(0.340γ)(K x ray, 0.124, 0.244, 0.340, 0.41, 0.77, 1.09, 1.26, 1.41γ)
$(0.47 < E_\beta < 0.55)$(0.124, 0.340γ)
Intensities in singles and coincidence spectra imply ~10% of 0.340γ and ~5% of 1.41γ are in ε branch
0.084γ may be same as that in Sm^{154} observed by α,α'γ, p,p'γ

57B12 S.K.Bhattacherjee, S.Raman, Nuclear Phys. 4, 44 (1957).

γ($Gd^{152,154}$, $Sm^{152,154}$)			$Eu^{152,154}$	source
86†	0.341	34†	0.871	sπ Cp
14†	0.427	93†	0.958	
10†	0.593*	119†	1.106	
21†	0.717	43†	1.281	
60†	0.779	100†	1.409	

*Composite

55D42 B.S.Dzhelepov, N.N.Zhukovskiĭ, V.G. Nedovesov, Izvest. Akad. Nauk Sér. Fiz. SSSR 19, 296 (1955), Columbia Tech. Transl. p.269.

Eu^{155} 63 92 1.7^y

β^-	77% 0.15 *1*		scin
	23% 0.24 *1*		
γ(Gd^{155})	0.084		scin
	0.102		
x	L x ray	scin βx,	x,xx
	K x ray		scin

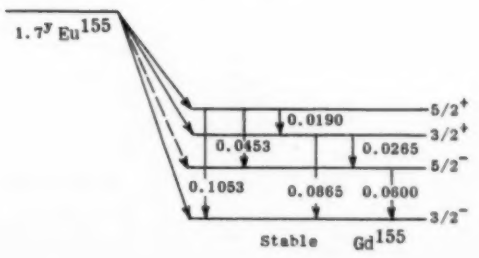
(0.15β)(0.084, 0.102γ, L x ray, K x ray)
(L x ray)(0.084γ, K x ray) No (0.24β)(γ, x)
No (0.084 γ)(0.102γ, K x ray)
No (0.102 γ)(K x ray)
Observed higher energy β's and γ's were attributed to Eu^{152} and Eu^{154}

56D31 V.S.Dubey, C.E.Mandeville, M.A. Rothman, Phys. Rev. 103, 1430 (1956); Bull. Am. Phys. Soc. 1, No. 4, 164 B12 (1956).

γ(Gd^{155}) Eu^{153}(2n,γ)

41*	~0.1†	0.0189 *1*	sπ ce, cryst
8*	~4†	0.0265 *3*	
5*	2.3†	0.04529 *1*	
29*	~4†	0.06000 *2*	
136*	100†	0.08654 *1*	
77*	64†	0.10532 *3*	

*Relative ce intensities
†Relative photon intensities



57B115 F.Boehm, E.N.Hatch, Bull. Am. Phys. Soc. 2, No. 4, 231 W3 (1957); verbal report.

Eu^{156} 63 93 14^d

Sm^{154}(pile 2n, $\gamma\beta$) chem

β^-	**0.500** *30*			
	1.220 *25*			
	2.455 *15*			
$\gamma(Gd^{156})$				
100†	**0.0890**	K/L = 0.88 *5*	E2	sl ce
3†	**0.1992**	K/L = 2.9 *3*	E2	
	1.868 *5*	**2.021** *5*		scin
	1.932 *5*	**2.091** *5*		
	1.958 *5*	**2.183** *5*		

Other known γ's not studied

57E35 G.T.Ewan, J.W.Knowles, D.R.MacKenzie, Bull. Am. Phys. Soc. 2, No. 5, 259 B3 (1957); verbal report.

β^- **2.45** *5* Eu^{153}(pile 2n,γ); s

$\gamma(Gd^{156})$	**0.08897** *1*		cryst
	0.19919 *2*		
	0.585?	**1.130**	sl pe
	0.630	**1.150**	**1.972**
	0.690	**1.240**	**2.033**
	0.723	**1.250**	**2.070**
	0.808	**1.270**	**2.094**
	0.960	**1.744**	**2.128**
	1.027	**1.778**	**2.169**
	1.075	**1.948**	**2.182**

Photon energies $\gtrsim$ 0.585 have errors of 0.010

56B123 F.Boehm, E.N.Hatch, Bull. Am. Phys. Soc. 1, No. 8, 390 M7 (1956); verbal report.

Gd 64 Relative isotopic abundances ms

Gd^{152}	**0.205%** *10*		
Gd^{154}	**2.23%** *3*	Gd^{157}	**15.70%** *16*
Gd^{155}	**15.10%** *15*	Gd^{158}	**24.50%** *25*
Gd^{156}	**20.6%** *2*	Gd^{160}	**21.6%** *2*

No Gd^{149}, Gd^{150}, Gd^{161} ($< 2 \times 10^{-3}$%)
No Gd^{151} ($< 4 \times 10^{-4}$%) No Gd^{153} ($< 2 \times 10^{-4}$%)
No Gd^{159}, Gd^{162} (< 0.01%) No Gd^{163} ($< 1 \times 10^{-3}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Capture γ's $Gd(n,\gamma)$ pulsed n's scin

E_γ	E_n(ev)
0.20 *1*	~0.25, ~2.7, 6.3
0.65 *2*	~0.25
0.95 *3*	~0.25
1.16 *4*	~0.25

No γ with $0.1 < E_\gamma < 0.7$ for E_n = 2.0 and 7.8 ev

57F03 C.A.Fenstermacher, T.E.Springer, H.L. Schultz, Bull. Am. Phys. Soc. 2, No. 4, 218 S10 (1957).

Gd^{151} 64 87 ~150^d

$\gamma(Eu^{151})$ $Eu^{(151)}$(26-Mev d, 2n)

4.6†	**0.0213** *2*		pc
	0.080		sl ce_{LM}
	0.144	K/LM	scin $\gamma\gamma$; sl ce_K?
6†	**0.155**	>10	scin, sl ce
	0.176	4.8	sl ce
4†	**0.240**	~1	scin, sl ce
~0.3†	**0.299** *10*		scin
x 100†	**K x ray**		scin, pc

(K x ray)(0.021, 0.155, 0.240γ) scin
(0.155γ)(0.14γ)

57B90 A.Bisi, E.Germagnoli, L.Zappa, Nuclear Phys. 3, 670 (1957).

Gd^{153} 64 89 236^d (K x ray)(0.098γ) delay $< 1^{m\mu s}$ scin

56V19 M.Vergnes, N.Marty, J. phys. radium 17, 908 (1956).

Gd^{154} 64 90 Reaction γ $Gd^{(154)}(p,p'\gamma)$ E_p = 1.75

0.124 *1* $\epsilon B(E2) = 0.7$ *3* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ $Gd^{154}(\alpha,\alpha'\gamma)$ E_α = 6

0.123 *1* $\epsilon B(E2) = 1.9$ *6* scin γ

56H78 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150; 98, 1198A (1955).

Gd^{155} 64 91 Ground state

J	3/2	para
$\lvert\mu\rvert$	**0.24***4	

$|\mu(Gd^{155})/\mu(Gd^{157})| = 0.75$ *7*
$|\mu(Eu^{151})/\mu(Gd^{157})| = 11.3$
*Using $\mu(Eu^{151}) = 3.6$

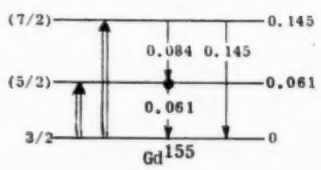
56L29 W.Low, Phys. Rev. 103, 1309 (1956).

Reaction γ's $Gd^{155}(\alpha,\alpha'\gamma)$ E_α = 6

0.145 level B(E2) = 1.3 4 scin γ

100†	**0.084** *1*	
26†	**0.145** *2*	

(K x ray)(K x ray, 0.084γ)



56H78 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150; 98, 1198A (1955).

$Gd^{156}_{64\ 92}$

Reaction γ $Gd^{(156)}(p,p'\gamma)$ $E_p = 1.75$

0.090 *1* $\epsilon B(E2) = 2.8$ *7* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ $Gd^{156}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.088 *1* $\epsilon B(E2) = 0.9$ *3* scin γ

56H78 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955).

Resonances $Gd^{155}(n)$ $E_n = 1$ to 50 ev

(Excitation = 7.8 Mev) chopper

E_o(ev)	$g\Gamma_n$(mev)	Γ_γ(mev)
2.145	0.13 *2*	113 *40*
6.49	1.57 *6*	106 *20*
7.95	0.77 *4*	142 *58*
12.1	0.43 *13*	137 *120*
14.7	1.1 *2*	97 *60*
20.2	2.55 *36*	91 *25*
21.3	8.8 *12*	62 *45*
23.9	3.1 *5*	108 *31*

13 additional resonances

$\overline{\Gamma_n^o}$ **1.1** *2* mev

$\overline{D}$ **4.2** *5* ev

$\overline{\Gamma_n^o}/D$ $\mathbf{2.6 \times 10^{-4}}$ *4*

57S57 F.B.Simpson, R.G.Fluharty, Bull. Am. Phys. Soc. 2, No.1, 42 NA7 (1957); verbal report.

$Gd^{157}_{64\ 93}$

Ground state

J **3/2** para

$|\mu|$ **0.32***5

$|\mu(Gd^{155})/\mu(Gd^{157})| = 0.75$ *7*

$|\mu(Eu^{151})/\mu(Gd^{157})| = 11.3$

*Using $\mu(Eu^{151}) = 3.6$

56L29 W.Low, Phys. Rev. 103, 1309 (1956).

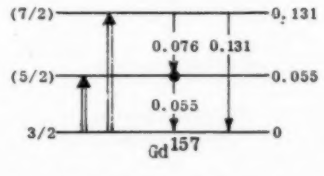
Reaction γ's $Gd^{157}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.131 level $B(E2) = 1.1$ *3* scin γ

100† **0.076** *1*

27† **0.131** *1*

(K x ray)(K x ray, 0.076γ)



56H78 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150; 98, 1198A (1955).

$Gd^{158}_{64\ 94}$

Reaction γ $Gd^{(158)}(p,p'\gamma)$ $E_p = 1.75$

0.080 *1* $\epsilon B(E2) = 3.4$ *8* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ $Gd^{158}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.078 *1* $\epsilon B(E2) = 0.6$ *2* scin γ

56H78 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955).

Resonances $Gd^{157}(n)$ $E_n = 1$ to 50 ev

(Excitation = 6.3 Mev) chopper

E_o(ev)	$g\Gamma_n$(mev)	Γ_γ(mev)
2.98	0.15 *3*	(85)
17.1	10.3 *11*	85 *16*
44.3	5.0 *25*	(85)
49.0	12.3 *13*	86 *34*

$\overline{\Gamma_n^o}$ **2.6** *4* mev

$\overline{D}$ 29 *11* ev

$\overline{\Gamma_n^o}/D$ $\mathbf{0.87 \times 10^{-4}}$ *37*

57S57 F.B.Simpson, R.G.Fluharty, Bull. Am. Phys. Soc. 2, No. 1, 42 NA7 (1957); verbal report.

$Gd^{159}_{64\ 95}$ 18^h

$\gamma(Tb^{159})$ $Gd^{(158)}(0.025\text{-Mev n},\gamma)$

12.3% **(0.364)** scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$Gd^{160}_{64\ 96}$

Reaction γ $Gd^{(160)}(p,p'\gamma)$ $E_p = 1.75$

0.076 *1* $\epsilon B(E2) = 3.4$ *8* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ $Gd^{160}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin γ

0.073 *1* $\epsilon B(E2) = 0.50$ *15*

56H78 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956).

Tb 65

Relative isotopic abundances ms

Tb^{159} **100%**

No Tb^{155}, Tb^{156} ($< 2 \times 10^{-5}$%)

No Tb^{157} ($< 4 \times 10^{-5}$%) No Tb^{158} ($< 1 \times 10^{-4}$%)

No Tb^{160} ($< 4 \times 10^{-4}$%)

No Tb^{161}, Tb^{162} ($< 3 \times 10^{-4}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

$Tb^{156}_{65\ 91}$ 5.0^h

τ 5.0^h

$\gamma(Tb^{156})$ 0.0890 s77 ce

Mass assignment from activation data and use of enriched isotopes

56M73 J.W.Mihelich, B.Harmatz, T.H.Handley, J.J.Pinajian, Bull. Am. Phys. Soc. 1, No. 7, 330 J10 (1956); verbal report.

$Tb^{158}_{65\ 93}$ 11^s

τ 11.0^s *1* $Tb^{159}(\geq 10\text{-Mev } \gamma, n)$

x Tb K x ray crit a

No γ scin

57H12 C.L.Hammer, M.G.Stewart, Phys. Rev. 106, 1001 (1957); Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956).

$Tb^{159}_{65\ 94}$

Reaction γ's $Tb^{159}(\alpha,\alpha'\gamma)$ E_α = 3 to 6

0.136 level B(E2) = 2.2 *7* scin γ

(0.057)

100† 0.079 (α = 3.3)

13† 0.136 *1* (α = 1.0)

(K x ray)(K x ray, 0.079γ)

56H79 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150; 98, 1198A (1955); Bull. Am. Phys. Soc. 1, No. 1, 43 K11 (1956).

Reaction γ's $Tb^{159}(d,d'\gamma)$ E_d = 1.75

0.058 *1* ϵB(E2) = 0.4 *2* sd ce_L

0.081 *1* = 0.2 *1*

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

$Tb^{160}_{65\ 95}$ 73^d

β^- 1† 0.550 (sl β)(scin γ)

1† 0.880

(0.550β)(0.30, ~0.9γ) (0.880β)(~0.9γ)

(0.085γ)(~0.9γ)

55S93 I.P.Stepanenko, L.Ya.Shavtvalov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 318 (1955), Columbia Tech. Transl. p.289.

τ 73.0^d *5* $Tb^{159}(n,\gamma)$

2 samples followed for 90 days each GM

57T11 H.Thiry, Bull. Soc. Roy. Sci. Liège 26, 29 (1957).

β^- ~22% 0.455 *20* $Tb^{159}(n,\gamma)$; 6-gap-s

42% 0.575 *10*

36%$^\$$ 0.870 *10*

0.4% 1.765 *30*

$^\$$Proposed decay scheme requires a 10% 0.79β and a 26% 0.87β

Continued

$Tb^{160}_{65\ 95}$ 73^d

Continued

$\gamma(Dy^{160})$			K/L	α_K	scin,s ce
1640*	10†	0.087	0.53	1.6	E2
18*		0.092			
90*	8†	0.196	2.4		E2
14*		0.216	>6		E1
42*	30†	0.298	7.8	0.014	E1
<2*	3†	0.395		<0.008	E1
~0.7*		~0.744			
~1*		~0.766			
11*	33†	0.876	~7	0.0034	E2
10*	35†	0.964[1]	~8	0.0029	E2+M1
		1.080			
1.2*	16†	1.180		0.00075	E1
~0.4*	8†	1.272		0.0005	E1

*ce_K per $10^4\beta$ (±10%) γ energy accuracy ±1%

†Photons per 100 disintegrations (±30%)

No 0.681γ (<0.5%) scin $\gamma\gamma$

(1.080γ)(0.196γ)(θ) A_2 = −0.18 *4* A_4 ~ 0

For J = 3(D), 4(Q), 2, A_2 = −0.14

(0.4 *1*β)(0.395, 1.27γ) s β, scin γ

(0.55 *5*β)(~0.20, 0.298, 1.180γ)

(>0.70β)(0.196γ)

(0.85 *3*β)(0.087γ, 0.876 + 0.964γ's)

(0.087γ)(0.395, 0.876[a], 0.96[a], 1.180, 1.272γ)

(0.196γ)(0.087, 0.216, ~0.78, 1.08γ)

(0.216γ)(0.087, 0.196, ~0.78, 0.96γ)

(0.298γ)(0.087, ~0.20, 0.876[b], 0.96[b]γ)

(1.080γ)(0.087, 0.196γ)

[1]$\gamma\gamma$ data show that this γ is double

[a]0.96γ/0.876γ = 0.36 *10*

[b]0.96γ/0.876γ = 0.68 *10*

57N03 O.Nathan, Nuclear Phys. 4, 125 (1957).

β^- 58 7% 0.560 *15* s

38 7% 0.860 *15*

<2 % ~1.70

No Gd K x ray (<0.5%) cryst

No 0.682γ (<20†)

(ce_K 0.087γ)(0.880, 1.179, not 1.273γ)

$\gamma(Dy^{160})$			s ce, scin, cryst		
			K/L	α_K	
6760*	100†	0.0867	0.68 *7*	1.50	
244*	31†	0.197	2.3	0.18 *4*	
46*	25†	0.216	7.2 *18*	0.04 *1*	
115*	197†	0.299	>4	0.013 *3*	
31*	223†	0.880	>4	0.0030 *6*	
30*	262†	0.966	>5	0.0025 *5*	
3.4*	114†	1.179	>4.5	0.00066 *13*	
1.7*	62†	1.273		0.00061 *12*	
x	147†	Dy K x ray			

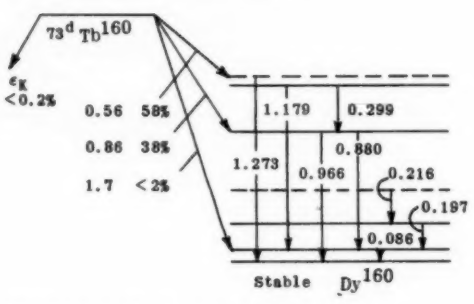
*Relative ce_K intensities

†Relative photon intensities

Continued

Tb^{160} 65 95 73^d

Continued



57C43 M.A.Clark, J.W.Knowles, Bull. Am. Phys. Soc. 2, No. 4, 231 W4 (1957).

Tb^{161} 65 96 7.2^d

					$Gd^{(160)}(n,\gamma\beta)$	chem
β^-	21%	0.439	42%	0.522		sm
	23%	0.496	14%	0.571 4		
$\gamma(Dy^{161})$					sl ce, scin	
	34*	0.0255 *1*	$L_1:L_2:L_3 = 1:0.75:1.1$			
			$\alpha_L = 2.1$	L/MN ~ 3		
	w	0.028				
	66*	0.0489 *1*	L/MN ~ 3	E2/M1 < 0.01		
		0.0569 *4*	$\alpha_L = 0.15$			
	3.3*	0.0746 *4*	$\alpha_L = 0.064$	K/L ~ 7		
	w	~0.104			*ce per 100 β's	

0.0783γ and 0.1321γ very weak, if present

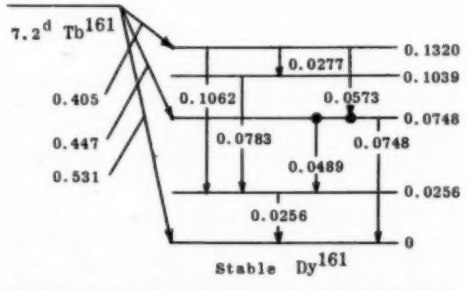
(~0.050 γ)(~0.025, ~0.075γ)

56S102 W.G.Smith, J.H.Hamilton, R.L.Robinson, L.M.Langer, Phys. Rev. 104, 1020 (1956).

τ		7.15^d	Gd^{160}(pile n,$\gamma\beta$)	
β^-	10%	0.405 *10*		sd
	22%	0.447 *10*	68% 0.531	
$\gamma(Dy^{161})$			K: L_1 : L_2 : L_3	sd ce
		0.0256	10 : 7.5 : 6.3	
		0.0277		
		0.0489	10 : 1.6 : 0.7	
		0.0573	10 : 2.5	
		0.0748	10: 5.5: 2.2	
		0.0780		
		0.1062		

(~0.050 γ)(~0.076, ~0.050, ~0.025 γ) scin

(~0.025 γ)(~0.025 γ)



56C58 J.M.Cork, M.K.Brice, L.C.Schmid, R.G. Helmer, Phys. Rev. 104, 481 (1956); Bull. Am. Phys. Soc. 1, No. 6, 297 R7 (1956).

Dy 66

Relative isotopic abundances ms

Dy^{156}	0.0570% *6*		
Dy^{158}	0.100% *1*	Dy^{162}	25.5% 2
Dy^{160}	2.35% *2*	Dy^{163}	24.9% 2
Dy^{161}	19.0% *1*	Dy^{164}	28.1% 2

No Dy^{154}, Dy^{157}, Dy^{159} ($<5 \times 10^{-5}$%)

No Dy^{155}, Dy^{166} ($<1.5 \times 10^{-4}$%)

No Dy^{165} ($<3.3 \times 10^{-3}$%) No Dy^{167} ($<1 \times 10^{-4}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Dy^{162} 66 96

Capture γ $Dy^{(161)}(n,\gamma)$ E_n = 2.7, 3.7 ev

12 *3*† **0.190** *10* pulsed n's

†Photons/100 Dy^{161} captures scin

57P03 C.A.Fenstermacher, T.E.Springer, H.L. Schultz, Bull. Am. Phys. Soc. 2, No. 4, 218 S10 (1957).

Resonances $Dy^{161}(n)$ chopper

E_0(ev)	Γ_n^0(mev)	Γ_γ(mev)
2.72	0.37 *4*	118 *30*
3.69	0.84 *8*	112 *45*
4.33	0.46 *9*	

D 2.3 *5* ev

$\langle\Gamma_n^0/D\rangle$ 1.8×10^{-4} *4*

57Z01 R.L.Zimmerman, Bull. Am. Phys. Soc. 2, No. 1, 42 NA9 (1957); verbal report.

Dy^{163} 66 97

Resonance $Dy^{162}(n)$ chopper

E_0(ev)	Γ_n^0(mev)	Γ_γ(mev)
5.45	9 *3*	174 *45*

57Z01 R.L.Zimmerman, Bull. Am. Phys. Soc. 2, No. 1, 42 NA9 (1957); verbal report.

Capture γ's $Dy^{(162)}(n,\gamma)$ E_n = 5.5 ev

27 *6*† **0.350** *15* pulsed n's

15 *6*† **0.390** *15* scin

†Photons/100 Dy^{162} captures

57P03 C.A.Fenstermacher, T.E.Springer, H.L. Schultz, Bull. Am. Phys. Soc. 2, No. 4, 218 S10 (1957); verbal report.

Dy^{164} 66 98

Capture γ's $Dy^{(163)}(n,\gamma)$ E_n = 1.7 ev

8 *2*† **0.175** *10* pulsed n's

6 *2*† **0.220** *10* scin

10 *4*† **0.680** *20*

19 *7*† **0.750** *20*

†Photons/100 Dy^{163} captures

57P03 C.A.Fenstermacher, T.E.Springer, H.L. Schultz, Bull. Am. Phys. Soc. 2, No. 4, 218 S10 (1957); verbal report.

$_{66}Dy^{164}_{98}$

Resonance — $Dy^{163}(n)$ — chopper

E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)
1.71	1.13 *9*	103 *10*

D — 10.3 *25* ev

$\langle\Gamma_n^o/D\rangle$ — 1.6×10^{-4} *4*

57Z01 R.L.Zimmerman, Bull. Am. Phys. Soc. 2, No. 1, 42 NA9 (1957); verbal report.

$_{66}Dy^{165}_{99}$ 2.3^h E.S.

β^- — 0.88 — a

1.32

55R57 Y.Robinet, L.Winand, G.Guében, Bull. soc. roy. sci. Liege 24, 313 (1955).

$_{67}Ho$

Relative isotopic abundances — ms

Ho^{165} 100%

No Ho^{161}, Ho^{162}, Ho^{163}, Ho^{164} ($< 1 \times 10^{-3}$%)

No Ho^{166}, Ho^{167}, Ho^{168} ($< 3 \times 10^{-4}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

$_{67}Ho^{160}_{93}$ 5.0^h

τ — 5.0^h

$\gamma(Ho^{160})$ — 0.0601 — s77 ce

Mass assignment from activation data and use of enriched isotopes

56M73 J.W.Mihelich, B.Harmatz, T.H.Handley, J.J.Pinajian, Bull. Am. Phys. Soc. 1, No. 7, 330 J10 (1956); verbal report.

$_{67}Ho^{163}_{96}$ 0.8^s

τ — 0.8^s *1* — $Ho^{165}(\geq 16.6\text{-Mev } \gamma, 2n)$ not by $Dy^{(164)}(\leq 75\text{-Mev } \gamma)$

$\gamma(Ho^{163})$ — 0.305 — scin

57H12 C.L.Hammer, M.G.Stewart, Phys. Rev. 106, 1001 (1957); Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956).

$_{67}Ho^{165}_{98}$

Levels — $Ho^{165}(p,p'\gamma)$ — $E_p = 2.9$

[B(E2) 0.206 level]/[B(E2) 0.094 level] = 0.195

from $0.112\gamma/0.094\gamma = 0.0564$ *40*,

$0.206\gamma/0.112\gamma = 0.14$ *1.5*

assuming $\alpha(M1) = 0.8$ of Rose's calc. value

56G47 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314 (1956).

Reaction γ's — $Ho^{165}(\alpha,\alpha'\gamma)$ — $E_\alpha = 3.4, 6$

0.094 level — B(E2) = 2.5 — scin

0.094 *1* ($\alpha = 2.4$)

0.206 level — B(E2) = 0.5 *2*

0.094 *1*

100† 0.112 *1* ($\alpha = 1.3$)

16† 0.206 *2* ($\alpha = 0.2$)

$(0.112\gamma)(K \text{ x ray})/(0.112\gamma)(0.094\gamma) \sim 8$

56H79 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955); 94, 1399 (1954); Bull. Am. Phys. Soc. 1, No. 1, 43 K11 (1956).

$_{67}Ho^{165}_{98}$

Reaction γ's — $Ho^{165}(p,p'\gamma)$ — $E_p = 1.75$

$Ho^{165}(d,d'\gamma)$ — $E_d = 1.75$

0.096 *1* — $\epsilon B(E2) = 1.6$ *8* — sd ce_K

$= 0.32$ *8* — sd ce_L

0.116 *1* — $= 0.07$ *3* — sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Reaction γ's — $Ho^{165}(\alpha,\alpha'\gamma)$ — $E_\alpha = 3.8, 4$

	K/L	E2/M1*	α*	
0.096	5.4 *5*	0.044	2.6	s ce
0.122	6.9 *10*	0	1.3	

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

$_{68}Er$

Relative isotopic abundances — ms

No Er^{160}, Er^{161}, Er^{163} ($< 1 \times 10^{-3}$%)

No Er^{165} ($< 6 \times 10^{-4}$%) No Er^{169} ($< 1.6 \times 10^{-3}$%)

No Er^{171}, Er^{173} ($< 1 \times 10^{-5}$%)

No Er^{172} ($< 2 \times 10^{-5}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Capture γ's — $Er(n,\gamma)$ — $E_n = 0.46, 0.58, 6.1, 9.5$ ev scin

35 *9*†	0.190 *10*	
6 *2*†	0.280 *10*	
14 *5*†	0.750 *25*	
30 *9*†	0.820 *20*	

†Photons/100 n captures at $E_n = 0.46$. About same values found at other 3 resonances.

57F04 C.A.Fenstermacher, R.L.Hickok, H.L.Schultz, Bull. Am. Phys. Soc. 2, No. 1, 41 NA 1 (1957); verbal report.

$_{68}Er^{167}_{99}$ 2.5^s

τ — 2.5^s *1* — $Er^{(168)}(\leq 75\text{-Mev } \gamma, n)$

$\gamma(Er^{167})$ — 0.213 — $\alpha_K \sim 0.6$ E3 — scin x/γ

57H12 C.L.Hammer, M.G.Stewart, Phys. Rev. 106, 1001 (1957).

$\gamma(Er^{167})$ — 0.208 — $9.6^d Tm^{167}$ source

$K:L_2:L_3 = 125:100:68$ E3 s77 ce

57M65 J.W.Mihelich, B.Harmatz, Phys. Rev. 106, 1232 (1957).

$_{68}Er^{169}_{101}$ 9.4^d

τ — 9.0^d *2* — $Er^{(168)}$(pile n,γ)

β^- — 0.340 *2* — sl

No γ ($< 10^{-4}/\beta$) — scin, pc

No 0.0084 photon (< 2%) — pc

56B130 A.Bisi, S.Terrani, L.Zappa, Nuovo cim. 4, 758 (1956).

Er^{169} 68 101 9.4^d

β^-		**0.330** *10*	$Er^{(168)}$(pile n,γ); s	
$\gamma(Tm^{169})$			$M_1:M_2:M_3:M_{45}$	
		(0.00842)	30:10:10: <0.5	sπ ce
No other γ			M1/E2 = 999	
15% of β's to 0.00842 level				s ce/β

56H72 E.N.Hatch, F.Boehm, Bull. Am. Phys. Soc. 1, No. 8, 390 M6 (1956); verbal report.

Er^{171} 68 103 7.8^h

τ		**7.80^h** *15*		$Er^{(170)}$(pile n,γ)	
β^-	~ 2%	**0.58**	93%	**1.05**	sl
	~ 1%	**0.87**	3%	**1.49**	
$\gamma(Tm^{171})$					sπ ce
300*		**0.1115**	K:L_1:M_1 = 25:7:1		
6*		**0.1165**	K:L_{23} = 1:2		
47*		**0.1238**	K:L_2:L_3:M_{23} = 47:54:41:14		
		0.210			scin $\gamma\gamma$
		0.285			
16*		**0.2954**			sl ce
20*		**0.3075**			
1†		**0.685**			scin
1†		**0.795**			
1†		**0.906**			

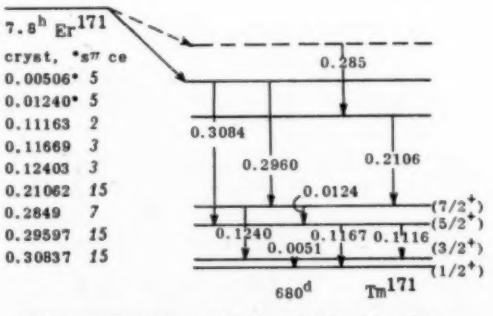
(0.124 γ)(0.295 γ) (0.307 γ)(0.111γ, 0.116γ)
(~0.113 γ)(0.210 γ)(0.285 γ)
No 0.085γ
*Relative ce_K intensities
†Relative to 100 for 0.295 + 0.307 photons

56C62 F.P.Cranston, M.E.Bunker, J.P.Mize, J.W.Starner, Bull. Am. Phys. Soc. 1, No. 8, 389 M5 (1956); verbal report.

β^-	94%	**1.11**	scin, scin $\beta\gamma$
	1%	**1.4**	scin $\beta\gamma$
	5%	**1.52**	scin, scin $\beta\gamma$
$\gamma(Tm^{171})$		**0.088**	scin
		~0.12	**~0.30**
		0.207	**0.42**

No 0.67β No 0.176, 0.80γ
(1.1β)(0.12, 0.30γ) (1.4β)(0.12γ)
β(0.088, 0.12, 0.207, 0.30, 0.42γ) delay
(0.307 γ)(0.113γ) (0.295 γ)(0.123γ)
(0.12 γ)(0.207, 0.30γ)

57J12 S.A.E.Johansson, Phys. Rev. 105, 189 (1957).



57H09 E.N.Hatch, F.Boehm, Bull. Am. Phys. Soc. 2, No. 4, 212 QA8 (1957).

Tm 69

Relative isotopic abundances ms

Tm^{169} **100%**

No Tm^{166}, Tm^{168} ($<2 \times 10^{-4}$%)
No Tm^{167} ($<1.5 \times 10^{-4}$%) No Tm^{170}($<1 \times 10^{-4}$%)
No Tm^{171}, Tm^{172} ($<5 \times 10^{-4}$%)

57C46 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Tm^{170} 69 101 127^d

β^-	22%	**0.882** *10*		sl
	78%	**0.957** *7*		

56N21 T.D.Nainan, H.G.Deware, A.Mukerji, Proc. Indian Acad. Sci. 44A, 111 (1956).

β^- longitudinal polarization (J = 1^- to $0^+, 2^+$)
−0.35 *11* E_β = 0.168 (v/c = 0.66)
More spins antiparallel to direction of motion
Measured scattering of β's by gold foil after deflection by electric field

57D21 H. de Waard, O.J.Poppema, Physica 23, 597 (1957).

Tm^{170} 69 101

Tm^{169}(n) E_n = 0.038 to 1.56 ev cryst
No resonances observed

56J27 E.G.Joki, J.E.Evans, Phys. Rev. 103, 1326 (1956).

Yb 70

Relative isotopic abundances ms

Yb^{168}	**0.135%** *2*		
Yb^{170}	**3.14%** *4*	Yb^{173}	**16.2%** *2*
Yb^{171}	**14.40%** *15*	Yb^{174}	**31.6%** *4*
Yb^{172}	**21.90%** *25*	Yb^{176}	**12.60%** *15*

No Yb^{165}, Yb^{169} ($<8 \times 10^{-4}$%)
No Yb^{166} ($<3 \times 10^{-4}$%) No Yb^{167} ($<2 \times 10^{-4}$%)
No Yb^{175} ($<1.6 \times 10^{-3}$%)
No Yb^{177}, Yb^{178} ($<1 \times 10^{-4}$%)

57C48 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Yb 70 ~13^d

τ	~13^d	
γ(Yb)	**0.0758**	sπ ce

56M73 J.W.Mihelich, B.Harmatz, T.H.Handley, J.J.Pinajian, Bull. Am. Phys. Soc. 1, No. 7, 330 J10 (1956); verbal report.

Yb^{169} 70 99 31^d

$\gamma(Tm^{169})$			$Yb^{(168)}$(pile n,γ)
0.47 5†	**0.0234** *2*		pc
x 30 *3*†	**Tm L x ray**		
100 †	**Tm K x ray**		

56B130 A.Bisi, S.Terrani, L.Zappa, Nuovo Cim. 4, 758 (1956).

$Yb^{169}_{70\ 99}$ 31^d

$\gamma(Tm^{169})$ $Yb^{(168)}$(pile n,γ)

	0.00817		s/7 ce
	0.02073		
	0.0450		
	0.06302	$L_1:L_2:L_3$ = 23:8:10	E1
		α_L = 0.19 *4*	
	0.09357	$L_1:L_2:L_3$ = 100:18:10[$]	
		α_K > 0.83 α_L = 0.34 *5*	
1750*	**0.1098**	$L_1:L_2:L_3$ = 167:30:10	
		α_K ~1.3 α_L = 0.30 *6*	
90*	**0.1182**	L_2/L_3 = 1.1	E2
410*	**0.1307**	$L_1:L_2:L_3$ = 28:128:100	
		α_L = 0.53 *5*	E2
680*	**0.1777**	L_1/L_3 ~10	
		α_K = 0.5 *1* α_L > 0.084	
928*	**0.1986**	L_1/L_3 ~10	
		α_K = 0.45 *9* α_L > 0.068	
~3*	**0.2621**		
34*	**0.3084**	α_K = 0.059 *12*	E2

(0.063 γX > 0.110γ) delay = 0.64$^{\mu s}$ *4*
(0.094 γX(0.063γ) delay = 0.045$^{\mu s}$
(K x ray)(0.063γ) delay = 0.4$^{\mu s}$ and 0.045$^{\mu s}$
α's based on α_K(0.130γ) = 0.47 and photon data of S.A.E.Johannson**
[$] Used L_2/L_3 = 1.8
*Relative ce$_K$ intensities

J.W.Mihelich, T.J.Ward, K.P.Jacob, Phys. Rev. 103, 1285 (1956); **S.A.E.Johannson, Phys. Rev. 100, 835 (1955).

$\gamma(Tm^{169})$ s ce; cryst

	0.00842 *5*			
	0.02075 *5*	$L_1:L_2:L_3$ = 200:25:10		
65†	**0.06312** *1*	α_{L_1} = 0.10	α_{L_2} = 0.02	
		α_{L_3} = 0.03		E1
4.4†	**0.09360** *4*	α_K = 2.4		M1 (+E2?)
		α_{L_1} = 0.42		
22†	**0.10978** *2*	α_K = 2.1		M1/E2 > 32
		α_{L_1} = 0.34		
2.6†	**0.11820** *3*	α_K = 0.66		E2
15†	**0.13053** *3*	α_{L_2} = 0.31		E2
		α_{L_3} = 0.27		
31†	**0.17724** *5*	α_K = 0.51		M1/E2 > 4
		α_{L_1} = 0.09		
51†	**0.19797** *6*	α_K = 0.40		M1/E2 > 4
		α_{L_1} = 0.07		
1†	**0.2404** *7*			E1?
8†	**0.2610** *5*			E1?
18†	**0.3077** *5*	α_K = 0.04, α_L = 0.01		E2

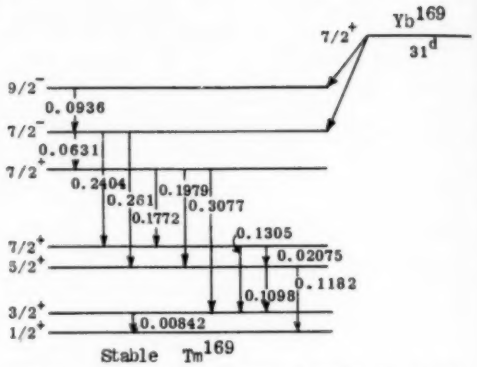
α's based on Sliv's calculated α_K(E2) = 0.54 for 0.130γ

56H68 E.N.Hatch, F.Boehm, P.Marmier, J.W.M. DuMond, Phys. Rev. 104, 745 (1956); Bull. Am. Phys. Soc. 1, No. 4, 170 E1 (1956).

$\gamma(Tm^{169})$ **(0.110)** M1 100% scin $\gamma\gamma(\theta)$
(0.131) E2 100%
(0.178) M1 100%
(0.199) E2/M1 = 0.25
(0.178γ)(0.131γ)(θ) J = 7/2, 7/2, 3/2
(0.199γ)(0.110γ)(θ) J = 7/2, 5/2, 3/2

57C03 U.Cappeller, R.Klingelhöfer, Z.Naturf. 12a, 84 (1957).

$Yb^{169}_{70\ 99}$ 31^d



56H68 E.N.Hatch, F.Boehm, P.Marmier, J.W.M. DuMond, Phys. Rev. 104, 745 (1956); Bull. Am. Phys. Soc. 1, No. 4, 170 E1 (1956).

$Yb^{173}_{70\ 103}$ Ground state

q +2.4 S

56K42 K.Krebs, H.Nelkowski, Z. Phys. 145, 543 (1956).

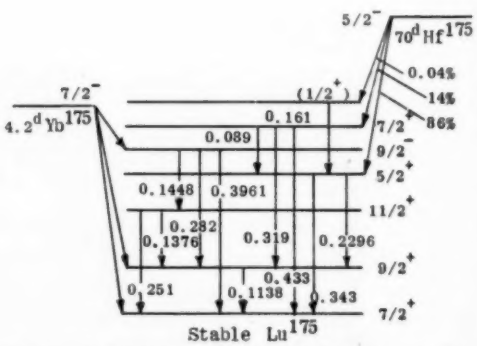
$Yb^{175}_{70\ 105}$ 4.2^d β(0.282, 0.396γ) delay = 3.4$^{m\mu s}$ *3* scin

57V01 H.Vartapetian, Compt. rend. 244, 65 (1957).

$\gamma(Lu^{175})$ s ce; cryst

31†	**0.11381** *2*	α_K = 1.6		M1/E2 = 4
	α_{L1} = 0.39	α_{L2} = 0.10	α_{L3} = 0.13	
2.2†	**0.13765** *5*	α_K = 1.0		M1 + E2
5.9†	**0.14485** *3*	α_K = 0.11		E1
3.8†	**0.2513** *5*			
62†	**0.28257** *13*	α_K = 0.030		E1/M2 = 49
		α_L = 0.0037		
100†	**0.3961** *3*	α_K = 0.067		E1/M2 = 4
		α_L = 0.0085		

α's based on α_K(E2) = 0.54 for $31^d Yb^{169}$ 0.130γ



56H68 E.N.Hatch, F.Boehm, P.Marmier, J.W.M. DuMond, Phys. Rev. 104, 745 (1956); Bull. Am. Phys. Soc. 1, No. 4, 170 E2 (1956).

$_{71}$Lu

Relative isotopic abundances ms

Lu^{175} **97.412%** *13*

Lu^{176} **2.588%** *13*

No Lu^{172}, Lu^{177}, Lu^{178} ($< 5 \times 10^{-5}$%)

No Lu^{173} ($< 1 \times 10^{-4}$%) No Lu^{174} ($< 1.5 \times 10^{-4}$%)

No Lu^{179} ($< 2 \times 10^{-5}$%)

57C48 T.L.Collins, F.M.Rourke, F.A.White, Phys. Rev. 105, 196 (1957).

Lu^{174} 71 103 $75^{\mu s}$

τ **$75^{\mu s}$** *2* $Lu^{(175)}(\geq 8\text{-Mev } \gamma, n)$

$\gamma(Lu^{174})$ **0.133** $\alpha_K \sim 0.5$ E2 scin x/γ

x **Lu K x ray** crit a

57H12 C.L.Hammer, M.G.Stewart, Phys. Rev. 106, 1001 (1957); Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956).

Lu^{175} 71 104

Ground state

J **7/2** S

μ **+2.0** *2*

q **+5.6** *5*

57S95 A.Steudel, Naturwiss. 44, 371 (1957).

Ground state

q **+3.6** *2* S

Recalculated from data of H.Gollnow*

57M96 K.Murakawa, T.Kamei, Phys. Rev. 105, 671 (1957); *H.Gollnow, Z. Phys. 103, 443 (1936).

Levels $Lu^{(175)}(p,p'\gamma)$ $E_p = 2.9$

[B(E2) 0.250 level]/[B(E2) 0.114 level] = 0.23

from 0.136γ/0.114γ = 0.0484 *30*,

0.250γ/0.136γ = 0.90 *15*

assuming α(M1) = 0.8 of Rose's calc. value

56G49 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314; Bull. Am. Phys. Soc. 1, No. 6, 282 B12 (1956).

Reaction γ's $Lu^{(175)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.114 level B(E2) = 2.5 *8* scin

0.114 *1* (α = 2.1)

0.250 level B(E2) = 0.8 *2*

0.114 *1*

100† **0.136** *1* (α = 2.0)

50† **0.250** *2* (α = 0.1)

(0.136 γ)(0.114γ)

56H79 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955); Bull. Am. Phys. Soc. 1, No. 1, 43 K11 (1956).

Reaction γ $Lu^{(175)}(p,p'\gamma)$ $E_p = 1.75$

0.114 *1* ϵB(E2) = 0.36 *9* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Lu^{175} 71 104

Reaction γ's $Lu^{(175)}(\alpha,\alpha'\gamma)$ $E_\alpha = 4$

	K/L	E2/M1*	α*	
0.114	4.3 *4*	0.11	2.3	s ce
0.139	5.5 *8*	0.08	1.4	

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

Lu^{176} 71 105 2.4x10^{10}y

natural Lu

τ **2.1×10^{10}y** *2* scin 0.31γ

$\gamma(Hf^{176})$ **0.089** pc ce

0.206 *5* scin

0.311 *7*

x **0.055** (K x ray)

0.366 and 0.523 *10* sum peaks interpreted as (K x ray)(0.311γ) and (0.311γ)(0.206γ) scin

No ϵ (no radiations other than above were seen)

57G21 R.N.Glover, D.E.Watt, Phil. Mag. 2, 699 (1957).

Lu^{176} 71 105

Ground state

J **6*** S

μ **+2.8** *3*

$\mu(Lu^{175})/\mu(Lu^{176})$ = + **0.7174** *15*

q **+8.0** *7*

$q(Lu^{175})/q(Lu^{176})$ = + **0.70** *4*

*J = 5 or 7 is not excluded

57S95 A.Steudel, Naturwiss. 44, 371 (1957).

Lu^{176}? 71 105 Reaction γ $Lu^{(176)}(\alpha,\alpha'\gamma)$ $E_\alpha = 4$

0.180

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

Lu^{177} 71 106 6.8^d

$\gamma(Hf^{177})$ **(0.072)** $\alpha_K = 1.03$ scin x/γ*

E1 100% $\gamma\gamma(\theta)$

(0.113) E2/M1 = 34 *4*

(0.208) E1 100%

(0.250) E2 100%

(0.072γ)(0.250γ)(θ) J = 9/2, 11/2, 7/2

$A_2 = -0.143$ *20*

(0.208γ)(0.113γ)(θ) J = 9/2, 9/2, 7/2

$A_2 = -0.135$ *10*

*(K x ray)(0.250γ)/(0.072γ)(0.250γ)

57O04 S.Ofer, Nuclear Phys. 3, 479 (1957).

$\gamma(Hf^{177})$ **(0.113)** E2/M1 = 28 $\gamma\gamma(\theta)$

(0.208) E1 100%

(0.208γ)(0.113γ)(θ) J = 9/2, 9/2, 7/2 scin

$A_2 = -0.146$ *4* $A_4 = 0.004$ *6*

57S107 K.G.Steffen, Z.Physik 147, 132 (1957).

$Lu^{178}_{71\ 107}$ 19^m

τ **18.7^m** *5* $Ta^{(181)}$(fast n,α)

$\gamma(Hf^{178})$

10†	**0.342** *3*		scin
1†	**0.445*** *5*		
	0.55?		

τ from decay of 0.342 γ

*Not sum peak a Pb

Possible lower energy γ's were not studied

A 22^m activity (Lu^{178} or Lu^{179}) is known from Hf($\leq$23-Mev γ,p) chem$^{\$}$

57S97 T.Stribel, Z.Naturf. 12a, 519 (1957). $F.D.S.Butement, Proc. Phys. Soc. 64A, 395 (1951).

Hf 72

Reaction γ's Hf(p,p'γ) E_p = 1.75

0.095 *1* $\epsilon B(E2)$ = 2.3 *9* sd ce_L

Average for Hf^{178} and Hf^{180}

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

$Hf^{175}_{72\ 103}$ 70^d

$\gamma(Lu^{175})$ s ce; cryst

40†	**0.08936** *1*	α_K = 2.2		M1/E2 = 32	
		α_{L12} = 0.43		α_{L3} = 0.022	
3.6†	**0.11381** *5*	$\alpha_K \sim 2$		M1/E2 = 9	
		$L_{12}/L_3 \sim 6$			
		α_K	α_L		
0.3†	**0.1613** *2*	0.5	0.2		
7.3†	**0.2296** *6*	0.11	0.05	E2	
	0.3189 *6*			M1/E2	
1000†	**0.34340** *8*	0.105	0.019	>3	
16†	**0.4330** *5*	0.061	0.0095	>3	

α's based on α_K(E2) = 0.49 for $45^d Hf^{181}$ 0.133γ

56H68 E.N.Hatch, F.Boehm, P.Marmier, J.W.M. DuMond, Phys. Rev. 104, 745 (1956); Bull. Am. Phys. Soc. 1, No. 4, 170 E2 (1956).

$Hf^{177}_{72\ 105}$ Levels Hf^{177}(p,p'γ) E_p = 2.9

[B(E2) 0.250 level]/ B(E2) 0.112 level] = 0.32

from 0.138γ/0.112γ = 0.034 *3*,

0.250γ/0.138γ = 4.3 *6*

assuming α(M1) = 0.8 of Rose's calc. value

56G47 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314 (1956).

Reaction γ's $Hf^{177}(\alpha,\alpha'\gamma)$ E_α = 6

0.112 level	B(E2) = 3.4 *10*		scin
0.112 *1*		(α = 2.7)	
0.250 level	B(E2) = 0.56 *17*		
0.112 *1*			
100†	**0.138** *1*	(α = 1.1)	
262†	**0.250** *2*	(α = 0.1)	

(0.138 γ)(0.112γ)

56H79 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150; 98, 1198A (1955); Bull. Am. Phys. Soc. 1, No. 1, 43 K11 (1956).

$Hf^{177}_{72\ 105}$ Reaction γ $Hf^{(177)}$(p,p'γ) E_p = 1.75

0.114 *1* $\epsilon B(E2)$ = 0.5 *2* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

$Hf^{178}_{72\ 106}$ Capture γ's $Hf^{(177)}$(n,γ) scin

E_γ	E_n = 1.10ev	E_n = 2.4ev
0.090 *5*	15 *3*†	12 *4*†
0.22 *1*	42 *8*†	39 *8*†
0.33 *1*	<13 †	13 *4*†

†Photons/100 Hf captures

57B108 C.K.Bockelman, C.A.Penstermacher, J.E.Draper, Bull. Am. Phys. Soc. 2, No. 1, 41 NA2 (1957); verbal report.

$Hf^{179}_{72\ 107}$ Levels Hf^{179}(p,p'γ) E_p = 2.9

[B(E2) 0.260 level]/[B(E2) 0.119 level] = 0.22

from 0.141γ/0.119γ = 0.048 *4*,

0.260γ/0.141γ = 0.50 *7*

assuming α(M1) = 0.8 of Rose's calc. value

56G49 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314; Bull. Am. Phys. Soc. 1, No. 6, 282 B12 (1956).

Reaction γ's $Hf^{179}(\alpha,\alpha'\gamma)$ E_α = 6

0.119 level	B(E2) = 2.6 *9*		scin
0.119 *1*		(α = 2.5)	
0.260 level	B(E2) = 0.23 *7*		
0.119 *1*			
100†	**0.141** *2*	(α = 2.0)	
44†	**0.260** *3*	(α = 0.1)	

(0.141 γ)(0.119γ)

56H79 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150; 98, 1198A (1955); Bull. Am. Phys. Soc. 1, No. 1, 43 K11 (1956).

Reaction γ $Hf^{(179)}$(p,p'γ) E_p = 1.75

0.123 *1* $\epsilon B(E2)$ = 0.3 *1* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

$Hf^{181}_{72\ 109}$ 45^d

τ **44.6^d** *2* $Hf^{(180)}$(n,γ) chem

Decay followed for 3.3 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$Hf^{181}_{72\ 109}$ 45^{d}

$\gamma(Ta^{181})$ $Hf^{180}(n,\gamma)$

ce_K/β		K/L	K/M	sl, scin ce
0.214 *8*	**0.133**	0.86 *4*	2.7 *2*	$L_{12}/L_3 = 1.5$.
0.088 *5*	**0.136** *7 1* **0.137**			K/LM
0.0047 *7*	**0.346**	3.2 *3*	12 *2*	2.7 *2*
0.020 *1*	**0.482**	4.1 *3*	40	3.7 *3*

$\alpha_K(0.136\gamma)/\alpha_K(0.133\gamma) = 2.5$ *3* scin $x\gamma/x\gamma$

$\alpha_K(0.133) = 0.50$ if 0.137 transition occurs in 4% of distintegrations sl ce_K/β

$\alpha_K(0.346\gamma) = 0.038$ *7*
$\alpha_K(0.482\gamma) = 0.023$ *2* } if 0.346 transition occurs in 13.6% of distintegrations sl ce_K/β

$(ce_K\ 0.137\gamma)/(ce_K\ 0.133\gamma) = 0.11$ *2* sl ce

$(ce_K\ 0.137\gamma)(0.482\gamma)$ delay $= 10^{m\mu s}$

E2/M1 for $0.482\gamma = 7$ from α_K; $= 25$ from $(0.133\gamma)(0.482\gamma)(\theta)$ if E2/M1 for $0.137\gamma = 0.2$

57S81 E.S.Snyder, S.Frankel, Phys. Rev. 106, 755 (1957).

$\gamma(Ta^{181})$

(0.1330)	E2 100%	scin $\gamma\gamma(\theta)$
(0.1362)	E2/M1 = 0.20 *4*	
(0.3458)	E2 100%	
(0.4820)	E2/M1 = 43 *9*	

$(0.133\gamma)(0.345\gamma)(\theta)$ J = 1/2, 5/2, 9/2
$(0.345\gamma)(0.136\gamma)(\theta)$ J = 5/2, 9/2, 7/2
$(0.133\gamma)(0.482\gamma)(\theta)$ J = 1/2, 5/2, 7/2
No $(0.476\gamma)(0.482\gamma)$

56D43 P.Debrunner, E.Heer, W.Kündig, R. Rüetschi, Helv. Phys. Acta 29, 463 (1956).

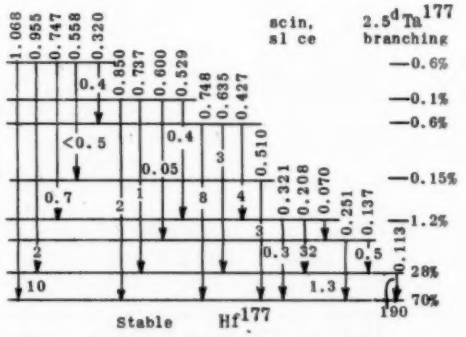
$(ce\ 0.133\gamma)(0.482\gamma)$ delay $= 8.6^{m\mu s}$ *10* scin

55B148 E.E.Berlovich, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 343 (1955), Columbia Tech. Transl. p.305.

liquid and solid sources
$(0.133\gamma)(0.482\gamma)(\angle)$ $J = 1/2^+, 5/2^+, 7/2^+$ scin

57S112 P.H.Stelson, F.K.McGowan, Phys. Rev. 105, 1346 (1957); Bull. Am. Phys. Soc. 1, No. 5, 264 F6 (1956).

$Ta^{177}_{73\ 104}$ 2.5^{d}



Numbers on γ lines are relative transition intensities

57M08 L.G.Mann, R.J.Nagle, H.I.West, Bull. Am. Phys. Soc. 2, No. 4, 231 W5 (1957).

$Ta^{179}_{73\ 106}$ $\sim 600^{d}$

x	46 *4*†	L x ray	Hf(26-Mev d); chem
	100 †	K_α x ray	pc

$E_e = 0.094^{+9}_{-4}$

No 0.12γ (< 0.02†) No 0.74γ scin

Used $\omega_K = 0.94$; $\omega_L = 0.20$; $n_{KL} = 0.81$

n_{KL} = number of L vacancies per K hole

56B103 A.Bisi, L.Zappa, E.Zimmer, Nuovo Cim. 4, 307 (1956).

$Ta^{181}_{73\ 108}$

Ground state

q **+2.7** *3* S

Recalculated from previous data*

57M96 K.Murakawa, T.Kamei, Phys. Rev. 105, 671 (1957); *T.Kamei, Phys. Rev. 99, 789 (1955).

0.482 level $46^{d}Hf^{181}$ source

J **5/2** $\gamma\gamma(\theta)$

μ **+3.25** *17* $\gamma\gamma(\theta,H)$

56D43 P.Debrunner, E.Heer, W.Kündig, R. Rüetschi, Helv. Phys. Acta 29, 463 (1956).

0.482 level $46^{d}Hf^{181}$ source

μ **+3.04** *13* $\gamma(\theta,H)$

$\tau = 10.6^{m\mu s}$ 4 was used

57K54 V.E.Krohn, S.Raboy, Phys. Rev. 107, 536 (1957); 95, 1689 (1954); Bull. Am. Phys. Soc. 2, No. 4, 230 V8 (1957).

Levels $Ta^{(181)}(p,p'\gamma)$ $E_p = 3.1$

[B(E2) 0.303 level]/[B(E2) 0.137 level] = 0.22 from $0.166\gamma/0.137\gamma = 0.0467$ *30*

Assuming $0.303\gamma/0.166\gamma = 0.574$ *50* and $\alpha(M1) = 0.8$ of Rose's calc. value

56G49 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314; Bull. Am. Phys. Soc. 1, No. 6, 282 B12 (1956).

Reaction γ's $Ta^{(181)}(p,p'\gamma)$ $E_p = 2.0, 2.9$

0.137 level scin

0.137 *3* B(E2) = 1.8*5 (α = 2.09)

0.303 level

0.137 *3*

1.5† **0.165** *4*

1† **0.302** *4* B(E2) = 0.5*1 (α = 0.08)

*Corrected for anisotropy

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

$Ta^{181}_{73\ 108}$

Reaction γ's $Ta^{(181)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.136 level		B(E2) = 2.1 *7*	scin
0.136 *1*		(α = 2.1)	
0.303 level		B(E2) = 0.37 *12*	
0.136			
2.8†	0.167	(α = 1.1)	
1†	0.303		

(0.167 γ)(0.136γ)

56H75 N.P.Heydenburg, G.M.Temmer, Phys. Rev. 104, 981 (1956); 100, 150 (1955); 94, 1399; 93, 351 (1954).

Reaction γ's $Ta^{(181)}(p,p'\gamma)$ $E_p = 3.7$

0.136 level		B(E2) = 1.7 *3*	scin
0.137 *1*		(α = 1.9)	
0.303 level		B(E2) = 0.47 *9*	
0.137 *1*			
1.45†	0.166 *2*	(α = 1.1)	
1†	0.303 *3*		
		(α = 0.08)	

(0.137 γ)(0.166γ)

57W32 E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 105, 238 (1957); 100, 1265A (1955).

Reaction γ's $Ta^{(181)}(\alpha,\alpha'\gamma)$ $E_\alpha = 4$

	K/L	E2/M1*	α*	
0.137	6.3 *6*	0.05	1.7	s ce
0.165	7.1 *10*	0	0.96	

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

Reaction γ's $Ta^{(181)}(N^{14},N^{14'}\gamma)$ $E_{N14} = 15.6$

0.138 *3* scin

0.301 *6*

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl. i Teoret. Fiz. 30, 809 (1956).

Reaction γ's $Ta^{(181)}(p,p'\gamma)$ $E_p = 3.7$

0.13662 *19* cryst

0.16599 *31*

57C41 A.F.Clark, J.W.DuMond, F.Gordon, H.Mark, Bull. Am. Phys. Soc. 2, No. 1, 69 HA5 (1957); verbal report.

$Ta^{182}_{73\ 109\ 115^d\ g.s.}$

τ 115.05^d *25* $Ta^{(181)}(n,\gamma)$

Decay followed for 1.8 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$Ta^{182}_{73\ 109\ 115^d\ g.s.}$

$\gamma(W^{182})$ $Ta^{(181)}$(pile n,γ)

13.9†	0.15241	7.1†	0.26409	cryst
5.85†	0.15637	100†	1.122	
6.91†	0.17936	9.0†	1.155	
3.45†	0.19831	59.5†	1.189	
18.6†	0.22205	136†	(1.222)	
7.9†	0.22927		(1.231)	

57S113 O.I.Sumbaev, Zhur. Eksptl.' i Teoret. Fiz. 32, 247; Soviet Phys. JETP 5, 170 (1957).

$\gamma(W^{182})$ **(0.0677)** (E1 100%) $\gamma\gamma(\theta)$

(1.122) E2/M1 = 9

(0.0677 γ)(1.122 γ)(θ) J = 2, 2, 2 scin

(0.0677 γ)(1.222 γ)(θ) J = 2, 2, 0

(0.1524 γ)(1.222 γ)(θ) J = 3, 2, 0

56W34 R.C.Williams, K.I.Roulston, Can. J. Phys. 34, 1087 (1956).

$Ta^{182}_{73\ 109}$

Resonance $Ta^{(181)}$(n) cryst σ_s,σ_t*

(Excitation = 6.1 Mev)

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n(mev)	Γ_γ(mev)	J
25 *3*	**4.282** *8*	3.9 *6*	49 *6*	4?

56W38 R.E.Wood, Phys. Rev. 104, 1425 (1956).
*R.L.Christensen, Phys. Rev. 92, 1509 (1953).

Resonances $Ta^{(181)}$(n) chopper

(Excitation = 6.1 Mev)

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n°(mev)	Γ_γ(mev)
12 4	**10.2** *1*	1.15 *19*	54 *10*
2.4 *8*	**13.6** *1*	0.26 *3*	36 *8*
1.1 4	**18.6** *2*	0.18 *2*	85 *20*
1.5 *7*	**20.1** *2*	0.26 4	
0.30 4	**22.3** *3*	0.055 *7*	
16 *7*	**23.7** *4*	1.8 4	21 *8*

E_o(ev)	Γ_n°(mev)*	E_o(ev)	Γ_n°(mev)*
29.9 *5*	0.066 *15*	**83** *2*	2.2 *8*
35.0 *6*	9 2	**99** *2*	~10
38.9 *7*	7 2	**105** *2*	8 *3*
48 *10*	0.6 *1*	**175** *2*	9.1 *37*
51.0 *5*	0.7 *1*	**126** *2*	7.2 *41*
57.4 *6*	0.2 *1*	**136** *2*	5 *3*
63.1 *15*	0.7 *3*	**173** *3*	7 5
76.9 *10*	1.7 *9*	**197** 4	6 5

$\frac{D}{\Gamma^\circ/D}$ 8.8 ev E_n = 10 to 63 ev

2.17×10^{-4} *22*

*Γ_γ = 50 mev and g = 1/2 were used

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J. Nuclear Energy 5, 92 (1957); Atom. Energiya 1, No.5, 55 (1956)

Ta^{182} 73 109

Resonances $Ta^{(181)}(n)$ E_n = 10 to 300 ev
(Excitation = 6.1 Mev) chopper

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)
2.2 *9*	**14.0** *2*	0.30 *6*	48 *15*
1.4 *6*	**20.5** *2*	0.24 *6*	52 *15*
7.1 *33*	**24.3** *3*	1.56 *24*	50 *24*
19.1 *69*	**39.3** *6*	8.4 *18*	40 *30*

19 additional resonances from 22 to 147 ev

Γ_n^o **1.88** *30* mev for E_n = 4 to 147 ev

$\underline{D}$ **7.8** *20* ev

Γ_n^o/D **1.7 x 10^{-4}** *3*

Γ_γ **49** *3* mev

56F28 R.G.Fluharty, F.B.Simpson, O.D. Simpson, Phys. Rev. 103, 1778 (1956).

Ta^{183} 73 110 5.0^d

τ **5.0**^{d} *4*

$\gamma(W^{183})$

		160†	**0.20987**
107†	**0.14412**	297†	**0.24426**
119†	**0.16053**	1000†	**0.24605**
336†	**0.16136**	148†	**0.29171**
165†	**0.16233**	248†	**0.31303**
18†	**0.20881**	391†	**0.35404**

$Ta^{(181)}$(pile 2n,γ) cryst

57S113 O.I.Sumbaev, Zhur. Eksptl.' i Teoret. Fiz. 32, 247; Soviet Phys. JETP 5, 170 (1957).

$W^{}_{74}$

Reaction γ's $W(n,n'\gamma)$ E_n = 0.5 to 1.5
~**0.10** scin

0.64, 0.77γ's shown due to $I^{127}(n)$

56S125 R.M.Sinclair, Westinghouse Research Report. 60-94511-6-P12 (1956); Phys. Rev. 99, 621A (1955).

Reaction γ $W(N^{14},N^{14'}\gamma)$ E_{N14} = 15.6
0.112 *2* scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret. Fiz. 30, 809 (1956).

W^{180} 74 106 5^{ms}

τ **5.0**^{ms} *10* $Ta^{(181)}$(20-Mev p,2n)

$\gamma(W^{180})$ ~**0.5** scin

56L46 O.I.Leipunskii, V.V.Miller, A.M.Morozov, P.A.Iampol'skii, Doklady Akad. Nauk SSSR 109, 935 (1956); Soviet Phys. Doklady 1, 505 (1956).

W^{181} 74 107 $14^{\mu s}$

τ **14.4**$^{\mu s}$ *3* W^{182}($\geq$8.3-Mev γ,n)

$\gamma(W^{181})$ **0.366** *4* α_K = 0.30 *3* scin x/γ
E1/M2 = 28/72

x **W K x ray** crit a

57B139 A.J.Bureau, C.L.Hammer, Phys. Rev. 105, 1006 (1957); Bull. Am. Phys. Soc. 1, No. 4, 206, R2 (1956).

W^{181} 74 107 145^d

$\gamma(Ta^{181})$ $Ta^{(181)}$(40-Mev d,2n) chem

~0.11%$^\$$	**0.136**	scin γ, s ce	
~0.17%$^\$$	**0.152**	α_K = 1.0*?	E1/M2 = 5.6

No (0.152 γ)(0.136γ)

No (K x ray)(0.152, 0.136γ)

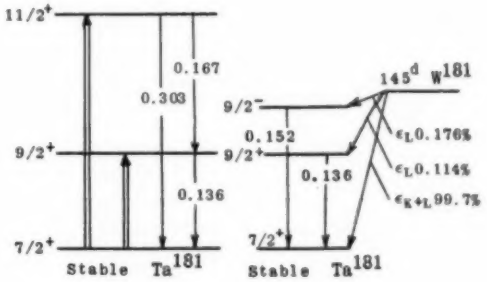
*Using α_K = 1.2 for 0.136γ

$\$$If (L x ray)/(K x ray) = 0.39

56D32 P.Debrunner, E.Heer, W.Kündig, R. Rüetschi, Helv. Phys. Acta 29, 235A (1956).

(L x ray)(0.136, 0.152γ) scin

56D44 P.Debrunner, E.Heer, W.Kündig, R. Rüetschi, T.Lindqvist, Helv. Phys. Acta 29, 432 (1956).



56D32 P.Debrunner, E.Heer, W.Kündig, R. Rüetschi, Helv. Phys. Acta 29, 235A (1956). Coulomb excitation results of others included in level scheme.

W^{182} 74 108

Reaction γ $W^{(182)}$(p,p'γ) E_p = 3.7
0.100125 *68* cryst

57C41 A.P.Clark, J.W.M.DuMond, F.Gordon, H.Mark, Bull. Am. Phys. Soc. 2, No. 1, 69 XA5 (1957); verbal report.

W^{183} 74 109

Level $W^{(182)}$(polarized th n,γ)
g.s. $J = 1/2^-$

From circular polarization of 6.18 capture γ

56T33 G.Trumpy, Nuclear Phys. 2, 664 (1956).

Reaction γ's $W^{(183)}$(p,p'γ) E_p = 3.7
0.046495 *12* cryst
0.052603 *13*

57C41 A.P.Clark, J.W.M.DuMond, F.Gordon, H.Mark, Bull. Am. Phys. Soc. 2, No. 1, 69 XA5 (1957); verbal report.

Resonances W^{182}(n,γ) E_n = 16 to 2000 ev
(Excitation ~6.7 Mev) pulsed n's

21.1 *3* ev	scin
112.5 *34*	
260 *11*	

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$W^{184}_{74\ 110}$

Reaction γ $W^{(184)}(p,p'\gamma)$ $E_p = 3.7$
0.11125 *12* cryst

57C41 A.P.Clark, J.W.M.DuMond, F.Gordon, H.Mark, Bull. Am. Phys. Soc. 2, No. 1, 69 XA5 (1957); verbal report.

Resonances $W^{183}(n,\gamma)$ E_n = 16 to 2000 ev
(Excitation ~7.4 Mev) pulsed n's
27.0 *5* ev scin
40.0 *8* **101** *3* ev
46.0 *9* **156** *6*

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$W^{185}_{74\ 111}$ 73^d g.s.

τ **70.0**^{d} *9* $W^{(184)}$(pile n,γ)
Decay followed for one half-life GM

57T11 H.Thiry, Bull. Soc. Roy. Sci. Liège 26, 29 (1957).

β^- **0.423** sl

55A54 T.Azuma, Bull. Naniwa Univ. 3A, 237 (1955).

β^- **0.440** *5* W^{184}(pile n,γ); sl
No 0.370β
No 0.057γ (< 2.4 *12* per $10^4\beta$) scin $\beta\gamma/\beta$
No > 0.057γ (< 4.6 *13* per 10^4 β)
No > 0.033γ (< 3.5 per $10^3\beta$) scin γ

57D49 V.S.Dubey, C.E.Mandeville, A.Mukerji, V.R.Potnis, Phys. Rev. 106, 785 (1957); Bull. Am. Phys. Soc. 2, No. 1, 25 G9 (1957).

β^- **0.425** *2* $W^{(184)}$(pile n,γ); sl
No ce_K 0.134γ, no ce_L 0.056γ sl ce
0.057 photon is Ta K x ray from $145^d W^{181}$ scin
~ 0.115 peak due to bremsstrahlung scin
0.590γ (0.02%) ascribed to unknown impurity

56M93 N.Marty, M.Vergnes, J. phys. radium, 17, 1013 (1956).

$\bar{E}_\beta$ = 0.144 *7* β calorimeter
$\bar{E}_\beta$(calculated) for 0.428β = 0.126

57S50 N.S.Shimanskaia, Zhur. Eksptl'. i Teoret. Fiz. 31, 393 (1956); Soviet Phys. JETP 4, 355 (1957).

$W^{185}_{74\ 111}$

Resonance $W^{184}(n,\gamma)$ E_n = 16 to 2000 ev
180 *6* ev pulsed n's, scin

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$W^{186}_{74\ 112}$

Reaction γ $W^{(186)}(p,p'\gamma)$ $E_p = 3.7$
0.12260 *13* cryst

57C41 A.P.Clark, J.W.M.DuMond, F.Gordon, H.Mark, Bull. Am. Phys. Soc. 2, No. 1, 69 XA5 (1957); verbal report.

$W^{187}_{74\ 113}$ 24^h

τ **24.04**^{h} *9* $W^{(186)}(n,\gamma)$
Decay followed for 6 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

β^-	10%	**0.340** *20*	$W^{(186)}$(pile n,γ); sl
	70%	**0.630** *10*	
	20%	**1.325** *15*	ΔJ = 2, yes shape
$\gamma(Re^{187})$		**0.072** *2*	sl pe, ce
		0.136 *2*	K/L = 5.0 *5* L/M = 3.5 *5*
		0.206 *3*	K/L = 4.5 *5*
	2†	**0.224** *3*	
	4†	**0.241** *3*	
	2†	**0.249** *3*	
	100†	**0.482** *4*	K/L = 4.0 *5*
	12†	**0.510** *4*	
	40†	**0.552** *5*	
	30†	**0.621** *6*	K/L = 3.8 *10*
	15†	**0.627** *6*	
	185†	**0.686** *6*	
	20†	**0.775** *5*	
	12†	**0.866** *5*	

(~0.63β)(0.686γ) No (0.686γ)γ
(0.482γ)(K x ray, 0.072, 0.136, ~0.21γ)
(0.866γ)(K x ray, 0.136, not 0.072γ)
(E_γ > 0.75)(0.072, 0.136γ)

57D49 V.S.Dubey, C.E.Mandeville, A.Mukerji, V.R.Potnis, Phys. Rev. 106, 785 (1957); Bull. Am. Phys. Soc. 2, No. 1, 25 G9 (1957).

$\gamma(Re^{187})$ $W^{(186)}$(0.025-Mev n,γ)
28.8% **(0.686)** scin

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$W^{187}_{74\ 113}$

Resonances $W^{186}(n,\gamma)$ E_n = 16 to 2000 ev
(Excitation ~6.4 Mev) pulsed n's
18.7 *3* ev scin
219.7 *88*

57B130 E.M.Bowey, Nuclear Phys. 3, 553 (1957).

$Re^{177}_{75\ 102}$ 17^m

τ W(120-Mev p), Re(120-Mev p) chem
17^m from β^+ decay, E_β = 0.4 s
p 2.2$^h W^{177}$, p 2.2$^d Ta^{177}$ chem

57H04 B.C.Haldar, E.O.Wiig, Phys. Rev. 105, 1285 (1957).

$Re^{178}_{75\ 103}$ 18^m

W^{182}(120-Mev p), Re(120-Mev p) chem

τ 18^m 2 from β^+ decay, $E_\beta = 2.1$ s

β^+ 3.1 s, a

p $22^d W^{178}$ chem

57H04 B.C.Haldar, E.O.Wiig, Phys. Rev. 105, 1285 (1957).

$Re^{180}_{75\ 105}$ 20^h g.s.

W^{180}(10-Mev p,n), Re(60-Mev p) chem

τ 20^h 1

β^+ 1.9 s, a

57H04 B.C.Haldar, E.O.Wiig, Phys. Rev. 105, 1285 (1957).

$Re^{183}_{75\ 108}$ 70^d

τ 70^d* 10 $Ta^{(181)}$(28-Mev α,2n) chem

$\gamma(W^{183})$

(0.04097)	(0.16053)	sm ce
(0.04648)	(0.16136)	
(0.05259)	(0.16233)	
(0.08292)	(0.19264)	
(0.08470)	(0.20881)	
(0.09907)	0.2453	
(0.10793)	(0.24605)	
(0.10973)	(0.29171)	
(0.14225)	(0.31303)	
(0.14412)	(0.35404)	

Energy values in parenthesis were taken from the Ta^{183} measurements of Murray et al.** The following γ's reported by them were not found in Re^{183}decay:

0.10194, 0.10249, 0.10314, 0.12038, 0.20327, 0.20506, 0.20987, 0.24426, 0.36560, 0.40658

E_γ	$L_1:L_2:L_3$	E2/(E2 + M1)
0.04648	120:21:10	0.01
0.05259	86:16:10	0.02
0.09907	11:10	1.00
0.16233	80:18:10	0.23

Estimates of ce intensities given

56T22 S.Thulin, J.O.Rasmussen, C.J.Gallagher Jr., W.G.Smith, J.M.Hollander, Phys. Rev. 104 471 (1956); *D.Strominger, ibid; **Phys. Rev.97, 1007(1955).

$Ta^{(181)}$(40-Mev α,2n) chem

(K x ray)($\sim$0.10, $\sim$0.16γ's) delay $<4^{m\mu s}$ scin

56S123 D.Strominger, UCRL-3374 (1956).

$Re^{184}_{75\ 109}$ 50^d

τ 52^d 10 Ta^{181}(40-Mev α,n) chem

$\gamma(W^{184})$

	0.1112	$\alpha\sim2$		sm ce; $\gamma\gamma/\gamma$
	0.240*	67†	0.780	scin
$\sim$1†	0.540*?	100†	0.890	
$\sim$1†	0.630*?			*only in $\gamma\gamma$

(0.78γ)(K x ray)/0.78$\gamma\sim$1.2 scin

(0.78γ)(0.11γ)/0.78$\gamma\sim$0.35

(0.89γ)(K x ray)/0.89$\gamma\sim$1.0

(0.89γ)(0.11γ)/0.89$\gamma\sim$0.03

(0.89γ)(0.24γ)/0.89$\gamma\sim$0.08

(0.24γ)(0.54, 0.63γ)?

(K x ray)(0.89γ) delay $<1.1^{m\mu s}$

(0.78γ)(0.11γ) delay $=0.9^{m\mu s}$ 3

56S123 D.Strominger, UCRL-3374 (1956).

$Re^{184}_{75\ 109}$ 50^d

$Ta^{(181)}$(28-Mev α,n) chem

$\gamma(W^{184})$ 0.1112 sm ce

56T22 S.Thulin, J.O.Rasmussen, C.J.Gallagher, Jr., W.G.Smith, J.M.Hollander, Phys. Rev. 104, 471 (1956).

$Re^{185}_{75\ 110}$

Ground state

$q(Re^{185})/q(Re^{187}) = +1.058$ 5 quad res

57S32 S.L.Segel, R.G.Barnes, Phys. Rev. 107, 638 (1957).

Levels $Re^{185}(p,p'\gamma)$ $E_p = 2.9$

[B(E2) 0.290 level]/[B(E2) 0.130 level] = 0.35

from 0.160γ/0.130γ = 0.0845 60,

0.290γ/0.160γ = 0.23 5

assuming α(M1) = 0.8 of Rose's calc. value

56G49 G.Goldring, O.T.Paulissen, Phys. Rev. 103, 1314; Bull. Am. Phys. Soc. 1, No. 6, 282 B12 (1956).

Reaction γ's $Re^{185}(p,p'\gamma)$ $E_p = 3.2$; scin

0.125 level

0.125 4 B(E2) = 0.8 2 (α = 2.85)

0.283 level

0.125 4

82 20† 0.158 5

10† 0.280 10 B(E2) = 0.4 1 (α = 0.09)

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D. Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Reaction γ's $Re^{185}(p,p'\gamma)$ $E_p = 2$, 4.2; scin

0.125 level B(E2) = 1.43

0.126 1 (α = 3.3)

0.283 level B(E2) = 0.56 11

0.126 1

4.24† 0.160 2 (α = 1.6)

1† 0.286 3 (α = 0.1)

(0.160γ)(0.126γ)

57W32 E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 105, 238 (1957); 100, 1265A (1955).

Reaction γ $Re^{(185)}(\alpha,\alpha'\gamma)$ $E_\alpha = 4$

	K/L	E2/M1*	α*	
0.125	2.2 2	0.62	2.2	s ce

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

$Re^{186?}_{75\ 111}$ $\sim1^h$

W(170-Mev p), Re(40-Mev p) chem

τ $\sim1^h$

57H04 B.C.Haldar, E.O.Wiig, Phys. Rev. 105, 1285 (1957).

$Re^{186}_{75\ 111}$ 3.7^{d} g.s.

$\gamma(Os^{186})$ $Re^{(185)}$(0.025-Mev n,γ)

10.5†	**(0.137)**	scin

†Photons per 100 disintegrations

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).

$\gamma(Os^{186})$ **(0.137)** E2 $\gamma\gamma(\theta)$

(0.627) E2/M1 = $(99 \pm 1)/(1 \pm 1)$

	A_2	A_4*
(0.627γ)(0.137γ)(θ)	− 0.02 *1*	+ 0.18 *3*

J = 2, 2, 0

δ = +10 *2*

*For this δ A_4 is + 0.31. Reduction may be due to extranuclear attenuation.

57L35 T.Lindqvist, I.Marklund, Nuclear Phys. 4, 189 (1957).

(0.4 < E_β < 0.9)(0.137 γ)(θ)	$\eta(\pi)$ = 0.055 *5*	scin
(0.4 < E_β < 0.6)(0.137 γ)(θ)	= 0.070 *6*	
(0.6 < E_β < 0.9)(0.137 γ)(θ)	= 0.131 *14*	

55J29 E.N.Jensen, ISC-707 p.9 (1955)

$Re^{187}_{75\ 112}$ Levels Re^{187}(p,p'γ) E_p = 2.9

[B(E2) 0.320 level]/ B(E2) 0.139 level] = 0.28

from 0.181γ/0.139γ = 0.076 *5*,

0.320γ/0.181γ = 0.22 *5*

assuming α(M1) = 0.8 of Rose's calc. value

56G49 G.Goldring, G.T.Paulissen, Phys. Rev. 103, 1314; Bull. Am. Phys. Soc. 1, No. 6, 282 B12 (1956).

Reaction γ's Re^{187}(p,p'γ) E_p = 2, 4.2; scin

0.135 level		B(E2) = 1.3 *3*	
	0.135 *1*		(α = 2.7)
0.303 level		B(E2) = 0.54 *11*	
	0.135 *1*		
3.99†	**0.168** *2*		(α = 1.3)
1†	**0.303** *3*		(α = 0.09)

(0.168γ)(0.135γ)

57W32 E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 105, 238 (1957); 100, 1265A (1955).

Reaction γ's Re^{187}(p,p'γ) E_p = 3.2; scin

0.135 level			
	0.135 *4*	B(E2) = 1.2 *3*	(α = 2.18)
0.300 level			
	0.135 *4*		
54 *15*†	**0.163** *5*		
10†	**0.300** *10*	B(E2) = 0.5 *1*	(α = 0.07)

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

$Re^{187}_{75\ 112}$ Reaction γ $Re^{(187)}$($\alpha,\alpha'\gamma$) E_α = 4

K/L	E2/M1*	α*	
0.135 4.6 *5*	0.13	2.3	s ce

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

$Re^{188}_{75\ 113}$ 17^{h} g.s.

β^-	~1%	<2	Re^{187}(pile n,γ); sl scin β(0.155γ)		
	20%	~2.0			
	79%	2.15 *4*			sl
$\gamma(Os^{188})$			K/L = 0.70 *5*		sl ce
			α_K = 0.29 *3*		sl ce/β
	630†	**0.155**			
	67†	**0.478***	14†	**1.307**	scin
	100†	~**0.63***	13†	**1.610**	
	35†	**0.828**	6†	**1.780**	
	43†	**0.931**	3†	**1.805**	
	8†	**1.132**	3†	**1.960**	

*Complex from $\gamma\gamma$ studies

(0.478 γ)(~0.48, ~0.63, 0.828γ, 1.13γ)	scin
(~0.63 γ)(0.48, ~0.63, 0.828γ, 1.13γ)	
0.931γ in coincidence with 0.155γ only	
No (0.828 γ)(1.13γ)	
No (E_γ > 1.6)(0.48, ~0.63, 0.828, 0.931γ)	

56P37 V.R.Potnis, Phys. Rev. 104, 722 (1956).

$\gamma(Os^{188})$ **0.15507** *8* cryst

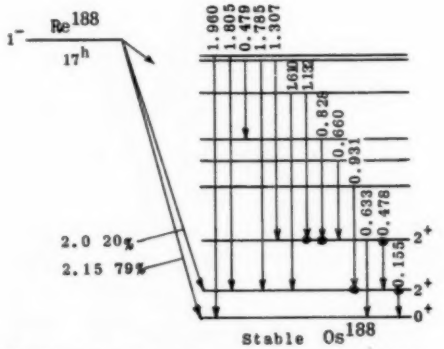
57H01 E.N.Hatch, F.Boehm, priv. comm. 1957.

$\gamma(Os^{188})$ $Re^{(187)}$(0.025-Mev n,γ)

16.2†	**(0.155)**	scin

†Photons per 100 disintegrations

57M16 R.L.Macklin, N.H.Lazar, W.S.Lyon, Phys. Rev. 107, 504 (1957).



56P37 V.R.Potnis, Phys. Rev. 104, 722 (1956).

$Re^{189}_{75\ 114}$ No long-lived activity $Re^{(187)}$(pile 2n,γ)

If τ = 150^{d} then $\sigma[Re^{188}(n,\gamma)] \leq 2$

56S86 R.R.Smith, J. Inorg. Nucl. Chem. 3, 157 (1956).

Os 76

Resonances		Os(n)		chopper	
E_o(ev)		$g\Gamma_n^o$(mev)*		E_o(ev)	$g\Gamma_n^o$(mev)
6.73	8	0.07	1	41.2 10	0.09 1
8.95	11	0.25	3	44.3 10	0.73 18
10.30	15	0.10[a]	1	50.6 14	1.0 2
12.6	2	0.031	6	55.8 18	0.7 2
18.8	3	0.17[b]	2	63.1 20	2.8 6
22.0	4	0.40[c]	5	66.4 20	0.47 11
27.9	6	0.6	1	78 3	7.0 23
38.8	10	1.1	2	90 4	4.5 18

Also E_o = 109, 125, 144, 166, 208, 333 ev
*Measured Γ_γ(mev): [a]86 14, [b]44 10, [c]62 14
Γ_γ = 67 mev was used for the others

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom. Energiya 1,No.5, 55 (1956).

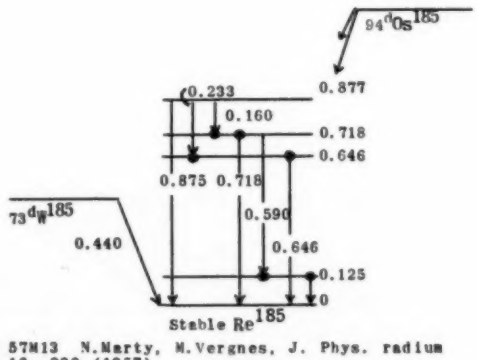
$Os^{185}_{76\ 109}$ 94^d

τ	94.3[d] 5		
$\gamma(Re^{185})$	0.1603		sd pe,ce
	0.2334	0.7177	
	0.5920	0.8715	
	0.6458	0.8789	

56N18 S.V.Nablo, M.W.Johns, Bull. Am. Phys. Soc. 1, No. 1, 42 K8 (1956).

$\gamma(Re^{185})$	0.125			scin, sl ce
	0.160			
	0.233 2			
≤1†	0.590 2	α_K		ce_K/γ
10†	0.646	0.011 2		K/LM = 5 1
≤1†	0.718	>0.022		
~1†	0.875	~0.005		

No evidence for 0.072γ No $\gamma^{\pm}$
(0.233γ)(0.646γ) (0.590γ)(0.125γ, 0.160γ?)
(0.160γ)(0.718γ not 0.875γ)
(K x ray)(K x ray, 0.65, 0.72, 0.88γ) delay <1$^{m\mu s}$



57M13 N.Marty, M.Vergnes, J. Phys. radium 18, 233 (1957).

$Os^{187}_{76\ 111}$? 39^h

	$Os^{(187)}$(130-Mev N^{14},N^{14}); chem	
τ	39[h] 2	
x	K x ray	scin

56G50 G.W.Greenlees, L.G.Kuo, Phil. Mag. 1, 973 (1956).

460722 O-58-8

$Os^{188}_{76\ 112}$? 26^d

	$Os^{(188)}$(130-Mev N^{14},N^{14}); chem	
τ	26[d] 2	
x	K x ray	scin

56G50 G.W.Greenlees, L.G.Kuo, Phil. Mag. 1, 973 (1956).

$Os^{188}_{76\ 112}$

Reaction γ	$Os^{(188)}$(p, p'γ)		E_p = 4
0.155 level	B(E2) = 1.9 6		scin
0.155			

57B11 R.Barloutaud, P.Lehmann, A.Lévêque, Compt. rend. 245, 523 (1957).

$Os^{189}_{76\ 113}$ 5.7^h

τ	5.7[h]		
$\gamma(Os^{189})$	0.0300	$L_{12}/L_3 \leq 0.17$	sl ce
		$L_3/M \sim 2$	
		$\alpha \sim 5000$	M3

d 11^dIr from $Os^{(188)}$(d,n) chem
Not d 11^dIr from $Ir^{(191)}$(n,2n) chem

57S17 G.Scharff-Goldhaber, D.E.Alburger, G.Harbottle, M.McKeown, Bull. Am. Phys. Soc. 2, No. 1, 25 G10 (1957); verbal report.

$Os^{189}_{76\ 113}$

Ground state		
q	+0.60 14	S

57M96 K.Murakawa, T.Kamei, Phys. Rev. 105, 671 (1957); K.Murakawa, Phys. Rev. 98, 1285 (1955).

	$Os^{(189)}$(p,p'γ)	E_p = 4
No γ observed		scin

57B11 R.Barloutaud, P.Lehmann, A.Lévêque, Compt. rend. 245, 523 (1957).

$Os^{190}_{76\ 114}$? 7^h

	$Os^{(190)}$(130-Mev N^{14},N^{14}); chem	
τ	7.2[h] 10	
x	K x ray	scin

56G50 G.W.Greenlees, L.G.Kuo, Phil. Mag. 1, 973 (1956).

$Os^{190}_{76\ 114}$ 10^m

		$Os^{(189)}$(d,p) chem		
$\gamma(Os^{190})$	0.039	α > 200	M2	sl ce
		$L_{12}/L_3 \sim 2$		
	0.187 1		E2	
	0.359 2		E2	
	0.500 3		E2	
	0.614 3		E2	

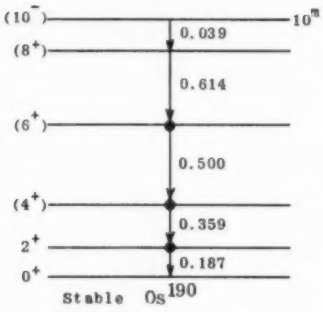
0.187, 0.359, 0.500, 0.614γ's in 4-fold coinc.
No 0.653 crossover γ

57S17 G.Scharff-Goldhaber, D.E.Alburger, G.Harbottle, M.McKeown, Bull. Am. Phys. Soc. 2, No. 1, 25 G10 (1957); verbal report.

Continued

Os^{190} 76 114 10^m

Continued



57S17 G.Scharff-Goldhaber, D.E.Alburger, G.Harbottle, M.McKeown, Bull. Am. Phys. Soc. 2, No. 1, 25 G10 (1957); verbal report.

Os^{190} 76 114

Reaction γ's $Os^{(190)}(p,p'\gamma)$ $E_p = 4$

0.190 level		B(E2) = 2.45
	0.190	
0.570 level		B(E2) = 0.12
	0.190	
65†	0.380	
~40†	0.580	

(0.380γ)(0.190γ)

57B11 R.Barloutaud, P.Lehmann, A.Lévêque, Compt. rend. 245, 523 (1957).

Os^{191} 76 115 15^d g.s.

τ **14.6^d** *3*

56N18 S.V.Nablo, M.W.Johns, Bull. Am. Phys. Soc. 1, No. 1, 42 K8 (1956).

Os^{192} 76 116

Reaction γ's $Os^{(192)}(p,p'\gamma)$ $E_p = 4$ scin

0.206 level		B(E2) = 2.1
	0.206	
0.500 level		B(E2) = 0.12
	0.206	
11†	0.290	
14†	0.500	

(0.290γ)(0.206γ)

57B11 R.Barloutaud, P.Lehmann, A.Lévêque, Compt. rend. 245, 523 (1957).

Os^{193} 76 117 31^h

τ **31.5^h** *1*

β^-

10%	0.677		sd
12%	0.855	33%	1.063
5%	0.997	40%	1.136 *5*

$\gamma(Ir^{193})$ 0.2508 sd pe,ce

0.2807 0.3876

0.3214 0.4604

0.3621 0.5582

Study covered $E_\gamma > 0.150$

56N18 S.V.Nablo, M.W.Johns, Bull. Am. Phys. Soc. 1, No. 1, 42 K8 (1956).

Os^{195} 76 119 6.5^m

τ **6.5^m**

β^- **2** a

p 2.3^h Ir^{195} chem

$Pt^{(198)}$ ($\leq$ 27-Mev n,α) chem

57B08 G.Baró, P.Rey, Z.Naturf. 12a, 520 (1957).

Ir 77

Resonances Ir(n) chopper

E_o(ev)	$g\Gamma_n^{\circ}$	E_o(ev)	$g\Gamma_n^{\circ}$(mev)	Γ_γ(mev)
		5.36 *2*	**1.5** *6*	**31** *14*
		6.12 *2*	**0.061** *4*	**44** *7*
		9.05 *4*	**0.61** *8*	**57.5** *86*

E_o(ev)	$g\Gamma_n^{\circ}$*	E_o(ev)	$g\Gamma_n^{\circ}$*	E_o(ev)	$g\Gamma_n^{\circ}$*
9.89	0.044 *3*	**24.25**	**4.9** *10*	**50.8**	**7.4** *24*
10.4	0.015 *2*	**29.2**	**1.27** *26*	**61.2**	**2.8** *5*
10.8		**30.6**	**0.43** *10*	**66.3**	**6.4** *12*
11.22		**35.2**	**0.15** *3*	**75.6**	**8.0** *20*
18.7	**0.18** *3*	**39.7**	**0.61** *33*	**93.5**	**14.5** *40*
19.65	**0.14** *2*	**41.7**	**5.6** *14*		

*units : mev

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom. Energiya 1,No.5, 55 (1956).

Ir^{191} 77 114 4.9^s

τ **4.9^s** *1* d $15^d Os^{191}$ chem

56C50 E.C.Campbell, F.Nelson, J. Inorg. Nucl. Chem. 3, 233 (1956).

Ir^{191} 77 114

Reaction γ's $Ir^{191}(p,p'\gamma)$ $E_p = 3.2$; scin

0.133 level		
	0.133 *4*	B(E2) = 0.5 *1* (α = 2.47)
0.356 level		
	0.133 *4*	
109 25†	**0.216** *6*	
100†	**0.356** *8*	B(E2) = 0.8 *2* (α = 0.05)

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Reaction γ's $Ir^{(191)}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.5$ to 3.85

	K/L	E2/M1*	α*	
0.083				s ce_L
0.129	3.94	0.23	2.4	s ce

*Obtained using coefficients of Sliv and Rose

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

Reaction γ $Ir^{(191)}(p,p'\gamma)$ $E_p = 1.75$

0.129 *1* ϵB(E2) = 0.12 *5* sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Ir^{192} 77 115 74^{d} g.s.

prism s ce

$\gamma(Os^{192})$

	L_1:	L_2:	L_3	K/L
(0.201)	100:	142:	89	1.85 4
(0.206)	100:	232:	141	1.83 4

$\gamma(Pt^{192})$

M_1:	M_2:	M_3					
100:	159:	87	(0.136)	10:	21:	17	
100:	169:	87	(0.296)	100:	139:	74	2.35 4
100:	190:	106	(0.308)	100:	118:	67	2.38 2
			(0.316)	100:	138:	73	2.22 2
			(0.468)	100:	68:	29	3.0 1
			(0.604)	100:	33:	13	4.7 1

	K/M	K/N	K/O
(0.296)	8.9 2		280 30
(0.308)	9.5 2	44 2	
(0.316)	9.3 2	38 1	255 7
(0.468)	10.2 2		

M_4, M_5, N_4, N_5 conversion was not observed

57K10 V.M.Kelman, R.Ya.Metskhvarishvili, V.A.Romanov, V.V.Tuchkevich, Nuclear Phys. 4, 240 (1957).

$\gamma(Os^{192})$

30†	0.26575		cryst
34†	0.48475		

$\gamma(Pt^{192})$

		372†	0.46798
226†	0.29594	40†	0.5884
231†	0.30845	77†	0.6045
610†	0.31646	56†	0.6129

57S113 O.I.Sumbaev, Zhur. Eksptl.' i Teoret. Fiz. 32, 247; Soviet Phys. JETP 5, 170 (1957).

$\gamma(Os^{192})$ 1† 1.053 sm Cp

$\gamma(Pt^{192})$

458† 0.466
174† 0.58 to 0.62
<0.2† 0.788?
3.7† 0.898

$\gamma(Os + Pt)$

909† 0.20 to 0.32

No γ with $1.6 < E_\gamma < 2.5$ ($< 0.02\%$)

55G62 M.P.Glazunov, B.S.Dzhelepov, Iu. V. Khol'nov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 294 (1955), Columbia Tech. Transl. p.267.

$\gamma(Pt^{192})$ (0.316) E2 100% scin $\gamma\gamma(\theta)$
(0.604) E2/M1 < 19
(0.604γ)(0.316γ)(θ) J = 3, 2, 0 $A_2 = -0.21$ 1
(0.588γ)(0.613γ)(θ) J ≠ 4, 2, 0 $\eta(\pi) = -0.01$ 2

$\gamma(Os^{192})$
(0.485γ)(0.206γ)(θ) J ≠ 4, 2, 0 $\eta(\pi) = -0.19$ 2
(K x ray)(0.206, ~0.30, ~0.47γ)
No (0.374γ)(K x ray, 0.206γ)

57S52 V.Shiel, L.D.Wyly, C.H.Braden, Phys. Rev. 105, 1521 (1957); Bull. Am. Phys. Soc. 1, No. 5, 264 F7 (1956).

No β^+, e^+ ($< 10^{-4}\%$) s

56D50 B.S.Dzhelepov, O.E.Kraft, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 318 (1956); Columbia Tech. Transl. p.293.

Ir^{192} 77 115 74^{d} g.s.

$\epsilon_K/\beta^- = 0.045$ 10 sd pe
From ratio of Os to Pt K x rays and previously measured* ratio of Os to Pt ce_K

56B90 A.A.Bashilov, Nuclear Phys. 1, 629 (1956); *Izvest. Akad. Nauk Ser. Fiz. SSSR 16, 264 (1952).

Ir^{193} 77 116 12^{d}

τ 11.9^{d} 5 Ir^{191}(pile 2n,γ) chem
$\gamma(Ir^{193})$ 0.08019 5 sd ce
$L_1:L_2:L_3 = 55:10:225$

57B112 F.Boehm, P.Marmier, Phys. Rev. 105, 974 (1957).

Ir^{193} 77 116

Reaction γ's $Ir^{193}(p,p'\gamma)$ $E_p = 3.2$; scin

0.143 level
0.143 4 B(E2) = 0.5 1 ($\alpha = 2.02$)

0.368 level
0.143 4
32 8† 0.230 6
100† 0.368 8 B(E2) = 0.3 1 ($\alpha = 0.04$)

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Reaction γ's $Ir^{(193)}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.5$ to 3.85
0.073* s ce_L
0.140 s ce
*A level at 0.073 is inferred from ce_L yield relative to yield from known level in Ir^{191} at 0.083

57B56 E.M.Bernstein, H.W.Lewis, Phys. Rev. 105, 1524 (1957).

Reaction γ $Ir^{(193)}(p,p'\gamma)$ $E_p = 1.75$
0.139 1 $\epsilon B(E2) = 0.06$ 3 sd ce_L

56H49 T.Huus, J.H.Bjerregaard, B.Elbek, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 17 (1956).

Pt^{193} 78 115 4.4^{d}

τ 4.4^{d} 2 Au^{197}(p,5n)Hg chem
$\gamma(Pt^{193})$ 0.0127 sl ce
0.1355 $K:L_1:L_3:MN = 5:7:14:8$
(ce_M 0.0127γ)(ce_L 0.135γ) delay = $2.2^{m\mu s}$ 8
No 0.1482γ

57E34 G.T.Ewan, Can. J. Phys. 35, 672 (1957).

Pt^{194} 78 116

Level $Pt^{(194)}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.3$
[B(E2) 0.620 level]/[B(E2) 0.328 level] ≤ 0.0022
from $0.293\gamma/0.328\gamma \leq 3.4 \times 10^{-4}$ scin $\gamma\gamma$

56B137 R.Barloutaud, T.Grjebine, P.Lehmann, A.Lévêque, J.Quidort, G.M.Temmer, Compt. rend. 244, 187 (1956).

Pt^{194} 78 116

Levels — $Pt^{194}(p,p'\gamma)$ E_p = 2.1 to 5.0

0.328 level	J = 2	p,γ(θ)
0.330 5	B(E2) = 1.75	scin γ
0.620 level		
0.292		
0.330		
0.622	B(E2) = 0.0087 *18*	

(0.292γ)(0.330γ)

p,γ(θ) in very good agreement with prediction of quantum-mechanical theory

57M43 F.K.McGowan, P.H.Stelson, Phys. Rev. 106, 522 (1957); 98, 249A; 99, 112, 127 (1955).

Pt^{197} 78 119 **80^m**

$\gamma(Pt^{197})$ **0.346** $Pt^{(196)}(n,\gamma)$; sm ce

56L44 J.M.LeBlanc, J.M.Cork, S.B.Burson, Phys. Rev. 104, 1670 (1956).

Pt^{197} 78 119

$Au^{197}(n,p)$ E_n = 14; ppl

σ(mb)	Level groups
<0.85	g.s.
8.6 *7*	0.20 *6*
2.2 *2*	1.60 *11*
2.0 *2*	2.88 *6*
5.2 *6*	4.44 *11*
2.5 *3*	6.05 *11*

57P18 R.A.Peck,Jr., Phys. Rev. 106, 965 (1957).

Pt^{199} 78 121 **29^m**

τ	**30^m** *3*		$Pt^{(198)}(n,\gamma)$
β^-	**0.8** *1*		scin β(0.71, 0.79, 0.96γ)
	1.1 *1*		β(0.197, 0.540γ)
	1.3 *1*		β(0.246, 0.318γ)
	1.7 *2*		no βγ; a
γ(Au^{199})	**0.074**	(not Au K x ray)	scin γγ
	0.197*	**0.540**	scin
	0.246*	**0.715**	
	0.318*	**0.790**	
	0.475	**0.960**	*sm ce

Relative intensity of 0.475, 0.715, 0.79, and 0.96γ's in βγ spectrum is 1/2 of that in singles suggesting τ(0.96 level) ~2μs

γ_a \ γ_b	0.074	0.197	0.246	0.318	0.475	0.540	0.715	0.790
0.074		Y	Y	N	Y	N	Y	N
0.197	Y		Y	Y	Y	Y		
0.246	Y	Y	N	N	Y	N		
0.318	N	Y	N	N	Y	N	N	N
0.475	Y	Y	Y	Y	N	N	N	N
0.540	N	Y	N	N	N	N	N	N
0.715	Y			N	N	N		
0.790	N			N	N	N		

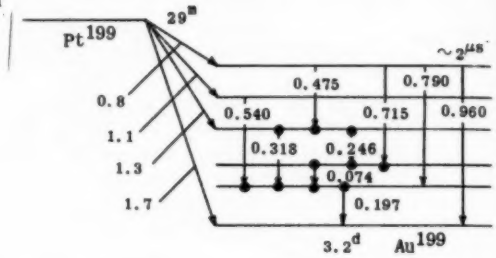
scin

Coincidences observed (Y), not observed (N)

Continued

Pt^{199} 78 121 **29^m**

Continued



56L44 J.M.LeBlanc, J.M.Cork, S.B.Burson, Phys. Rev. 104, 1670 (1956).

Pt^{200} 78 122 **11.5^h**

τ **11.5^h** *10* $Pt^{(198)}$(pile 2n,γ)

From milking $48^m Au^{200}$ from Pt

57R49 L.P.Roy, J.Roy, J.S.Merritt, Phys. Rev. 105, 1337 (1957).

Au^{188} 79 109 **4.5^m**

τ **4.5^m** $Ta^{(181)}$(60-Mev C^{12}) chem

β^+ magnetic deflection GM

No α (< 0.01%) scin

Mass assignment from relative yields

$15^m Au^{187}$: $4.5^m Au^{188}$: $42^m Au^{189}$ = 25: 100: 10

57C34 K.F.Chackett, G.A.Chackett, J. Inorg. Nuclear Chem. 4, 225 (1957).

Au^{193} 79 114 **17.5^h** g.s.

τ **17.5^h** 2 Au^{197}(33- to 58-Mev p,5nε) chem

γ(Pt^{193}) sm ce; sl ce,pe; scin

α_K		ce's/10^4 disintegrations 0.0127	K	L_1	L_2	L_3	MN
	0.31%	0.0343			31		
	0.21%	0.0374		21			
		0.0443*§					
	0.47%	0.0737		38			9
	0.87%	0.0998	31	11	20	16	9
	15.5%	0.1124	880	165	43	42	58
	2.8%	0.1140	120	40	42	13	11
	2.3%	0.1179	140	28			8
	1.0%	0.1194	50	14			4
1.77	1.12%	0.1557	62	11			4
1.55	6.10%	0.1735	330	48	9	5	18
1.1	21.3%	0.1861	1000	155	26	18	45
	0.22%	0.1875		15		7	
	0.025%	0.2213	2.5				
0.14	0.70%	0.2318	7.5		5.5	2.5	
0.48	7.31%	0.2556	220	38	5		8
	0.15%	0.2584	7.5			8	
0.17	5.52%	0.2682	75	15	9	6	7
0.15	0.23%	0.2900	3.0				
	0.03%	0.3036	3.0				
0.027	1.34%	0.3177§	3.5				
	0.01%	0.3348		0.9			
0.052	1.43%	0.3776	7.0				1

Continued

Au^{193} 79 114 17.5^h g.s.

Continued

0.072	0.28%	**0.4251**$^\$$	1.8	1.4	2
0.081	3.40%	**0.4401**	25	4.8	0.9
0.094	0.56%	**0.4774**	4.7	$\Sigma L = 0.9$	
0.025	0.57%	**0.4900**	1.4	$\Sigma L = 0.8$	

No $\gamma^{\pm}$ (<0.16%) No >0.5γ (<0.3%) scin

$ce_K/\epsilon = 0.29$ *3* scin xx/x, $x\gamma/\gamma$

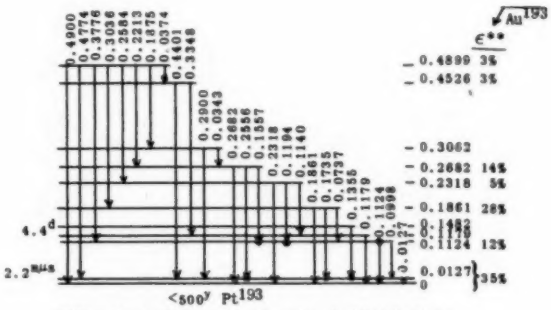
*From (ce_K 0.186γ)(ce 0.258, 0.0443γ)

(ce 0.173, 0.255γ)(ce 0.0127γ) delay = 2.2$^{m\mu s}$ *8*

No (ce 0.112, 0.186, 0.268γ)(ce 0.0127γ) delay

No coincidences between strong γ's

$^\$$Not included in decay scheme



**% of captures to levels indicated as derived from γ intensities

57E34 G.T.Ewan, Can.J.Phys. 35, 672 (1957.

Au^{195} 79 116 185^d g.s.

$\gamma(Pt^{195})$ $Pt^{(194)}$(15-Mev d,n) chem

1†	~0.031	scin
12†	**0.099**	
2†	**0.130**	

(K x ray)(0.031, 0.099, 0.130γ)

No (0.099γ)(0.130γ)

56P46 V.R.Potnis, Indian J. Phys. 30, 375 (1956); Bull. Am. Phys. Soc. 1, No. 4, 170 E3 (1956).

Au^{196} 79 117 5.6^d

$\gamma(Pt^{196})$ **(0.332)** E2/M1 = 96.7/3.3 $\gamma\gamma(\theta)$

(0.354) E2 100%

(0.332γ)(0.354γ)(θ) J = 2, 2, 0

56P47 V.R.Potnis, Indian J.Phys. 30, 375 (1956).

Pt(16-Mev d)

$\gamma(Pt^{196})$ **0.3318** *5* s77 ce

0.3545 *5*

(0.3318γ)(ce_K 0.3545γ)(θ) (scinγ)(sl ce)

$\eta(\pi) = +0.084$ *23*

(ce_K 0.3318γ)(0.3545γ)(θ)

$\eta(\pi) = -0.070$ *19*

No E0 contribution to η within expt. error

57K02 J.V.Kane, S.Frenkel, Bull. Am. Phys. Soc. 2, No. 1, 25 G11 (1957); verbal report.

Au^{197} 79 118 Levels $Au^{197}(p,p')$ $E_p = 6.0$

Level	B(E2)	s 60° to 130°
0.075 *4*	0.22	
0.268	0.066	
0.279 *5*	0.30	
0.546 *8*	0.42	

57E11 B.Elbeck, C.K.Bockelman, Phys. Rev. 105, 657 (1957).

Reaction γ's $Au^{197}(N^{14},N^{14'}\gamma)$ $E_{N^{14}} = 15.6$

0.286 *5*	scin
0.580 *10*	

56A36 D.G.Alkhazov, D.S.Andreyev, A.P. Greenberg, I.H.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl' i Teoret.Fiz. 30, 809 (1956).

Au^{198} 79 119 2.7^d

τ **2.72^d** *2* $Au^{197}(n,\gamma)$

Decay followed for 4.2 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$\gamma(Hg^{198})$ **(0.411)** Au^{197}(pile n,γ)

3†	**0.6711**	cryst
1†	**0.6789**	
	1.09 double	

57H07 B.Hammermesh, R.K.Smither, Bull. Am. Phys. Soc. 2, No. 4, 232 W6 (1957).

$\gamma(Hg^{198})$ $Au^{197}(n,\gamma)$

100†	**0.412** *4*	s77 Cp
1.11 *5*†	**0.680** *7*	
0.26 *2*†	**1.088** *10*	

55D41 B.S.Dzhelepov, N.N.Zhukovski, V.P. Prikhodtseva, Iu. V. Khol'nov, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 271 (1955); Columbia Tech. Transl. p.247.

$\gamma(Hg^{198})$ sd ce,pe

100	†	**(0.412)**	
0.97 *11*†	**(0.676)**	$\alpha_K = 0.019$ *5* M1/E2~0.6*	
0.156 *14*†	**(1.088)**	$\alpha_K = 0.0046$ *6*	E2

*Using α_K(E2) and 0.7α_K(M1) of Rose

56V20 J.Volpe, G.Hinman, Phys. Rev. 104, 753 (1956).

$\bar{E}_\beta = 0.317$ *15* β calorimeter

57S50 N.S.Shimanskaia, Zhur. Eksptl'. i Teoret. Fiz. 31, 393 (1956); Soviet Phys. JETP 4, 355 (1957).

$Au^{198}_{79\ 119}$ 2.7^d

No ϵ_K (<0.01%) sd pe
from absence of Pt $K_{\alpha 2}$ x ray

56B90 A.A.Bashilov, Nuclear Phys. 1, 629 (1956).

β^- longitudinal polarization ($J = 2^-$ to 2^+)

	E_β	v/c
-0.05^*6	0.10	0.55
-0.06^*5	0.12	0.6
$+0.02^\$23$	0.3 − 0.8	0.78 − 0.92
$+0.05^\$12$	> 0.3	> 0.78

*By scattering of β's by gold foil after deflection by electric field
$^\$$By Møller scattering of β's by magnetized Deltamax foil scin ee

57F27 H.Frauenfelder, R.Bobone, E.von Goeler, N.Levine, H.R.Lewis,Jr., R.N.Peacock, A.Rossi, G.DePasquali, Phys. Rev. 107, 909 (1957).

β^- longitudinal polarization ($J = 2^-$ to 2^+)
$+0.16\ 3$ $E_\beta = 0.168$ (v/c = 0.66)
More spins antiparallel to direction of motion
Measured scattering of β's by gold foil after deflection by electric field

57D21 H. de Waard, O.J.Poppema, Physica 23, 597 (1957).

β^-(right circular γ)(θ) = $1 + (0.52\ 9)\langle v/c\rangle \cos\theta$
$J = 2(\neq 3),\ 2,\ 0$
γ ray shown to be circularly polarized by scattering from magnetized iron

57B92 F.Boehm, A.H.Wapstra, Phys. Rev. 106, 1364 (1957); 107, 1462 (1957).

$Au^{198}_{79\ 119}$

Capture γ's	Au^{197}(th n,γ) (Excitation = 6.5 Mev)	
40 6†	0.066 3 (K x ray)	scin
11 2†	0.174 3	
19 4†	0.210 4	
22 4†	0.252 4	

Study covered $E_\gamma = 0.05$ to 0.50
†Photons/100 Au^{197} captures

57E31 I.V.Estulin, L.F.Kalinkin, A.S. Melioransky, Nuclear Phys. 4, 91 (1957).

Resonance	Au^{197}(n) (Excitation = 6.5 Mev)			cryst σ_s,σ_t
$\sigma_0(10^3 b)$	E_0(ev)	Γ_n(mev)	Γ_γ(mev)	J
37.0 5	4.906 10	15.6 4	124 3	2

56W38 R.E.Wood, Phys. Rev. 104, 1425 (1956); R.E.Wood, H.H.Landon, V.L.Sailor, Phys. Rev. 98, 639 (1955).

$Au^{198}_{79\ 119}$

Capture γ's	$Au^{197}(n,\gamma)$			cryst
178†	0.0551	10†	0.2038	11† 0.3110
22†	0.0971	9†	0.2078	15† 0.3160
2†	0.1449	128†	0.2149	30† 0.3280
34†	0.1584	6†	0.2190	22† 0.3430
3†	0.1626	51†	0.2352	21† 0.3500
5†	0.1660	17†	0.2388	9† 0.3540
49†	0.1682	77†	0.2471	13† 0.3700
19†	0.1699	89†	0.2608	51† 0.3810
6†	0.1805	15†	0.2710	18† 0.4390
3†	0.1852	14†	0.2760	2.5† 0.4518
8†	0.1877	21†	0.2910	2.5† 0.4906
48†	0.1935	11†	0.3080	5† 0.5046

†Photons per 1000 n captures

56H61 B.Hamermesh, D.Rose, R.K.Smither, Bull. Am. Phys. Soc. 1, No. 7, 346 X3 (1956); verbal report.

$Au^{199}_{79\ 120}$ 3.1^d

τ 3.14^d 2 $28^m Pt^{199}$ source chem
Decay followed for 5 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

$Au^{200}_{79\ 121}$ 48^m

β^- 2.2 d $11.5^h Pt$ chem; a
$\gamma(Hg^{200})$ 1.23 scin
Did not look for 0.37γ

57R49 L.P.Roy, J.Roy, J.S.Merritt, Phys. Rev. 105, 1337 (1957).

$Hg^{189}_{80\ 109}$ 23^m

τ 23^m 2 $Ta^{(181)}$(60-Mev N^{14}) chem
From milking $42^m Au^{189}$ from Hg
No 0.028γ scin γ,ce
No α (<0.1%) scin

57C34 K.F.Chackett, G.A.Chackett, J. Inorg. Nuclear Chem. 4, 225 (1957).

$Hg^{193}_{80\ 113}$ 12^h

β^+ Au^{197}(p,5n); sd
$\gamma(Au^{193})$

		K/L_1			K/L_1
	0.4997		145*	0.8787	8.1
	0.5102		102*	0.9138	5.4
	0.5354		429*	0.9331	6.4
	0.5373		63*	0.9969	4.8
2880*	0.5736	4.6	35*	1.113	
554*	0.6010	5.7	48*	1.175	
111*	0.6751		83*	1.243	
55*	0.7013$^\$$	2.0	50*	1.328$^\$$	2.8
	0.7618		34*	1.343$^\$$	1.9
70*	0.8612		32*	1.489	
80*	0.8708		14*	1.646	

*Relative ce$_K$ intensities $^\$$probably double

56B104 J.Brunner, J.Halter, H.J.Leisi, Helv. Phys. Acta, 29, 238A (1956).

$Hg^{195}_{80\ 115}$ 40^h

$\gamma(Au^{195})$ $Au^{197}(p,3n)$

80*	**0.5256**	$K/L_1 = 5.3$	sm, sd ce
1000*	**0.5605**	$K/L_1/M_1 = 100:21:5$	
110*	**0.5848**	$K/L_1 = 5.0$	
22*	**0.8210**		
	1.242		

Energy accuracy 0.2%
*Relative ce_K intensities

56B104 J.Brunner, J.Halter, H.J.Leisi, Helv. Phys. Acta, 29, 238A (1956).

$Hg^{195}_{80\ 115}$ $40^h + 9.5^h$

$\gamma(Au^{195})$ $Au^{197}(p,3n)$

110*	**0.5848**	$K/L_1 = 3.9$	sm, sd ce
360*	**0.5995**	$K/L_1/M_1 = 36:8:1$	
1000*	**0.7804**	$K/L_1 = 4.8$	
46*	**0.8210**		
	0.9304		
153*	**1.110**	$K/L_1 = 4.2$	
69*	**1.172**		

Energy accuracy 0.2%
*Relative ce_K intensities

56B104 J.Brunner, J.Halter, H.J.Leisi, Helv. Phys. Acta 29, 238A (1956).

$Hg^{197}_{80\ 117}$ 23^h

$\gamma(Hg^{197})$ **(0.133)** E2 $\gamma\gamma(\theta)$
(0.164) $\alpha = 350$ *90* M4 $\gamma\gamma/\gamma$
$(0.164\gamma)(0.133\gamma)(\theta)$ $J = 13/2,\ 5/2,\ 1/2$ scin
$(ce_{LM}\ 0.164\gamma)(ce_K\ 0.133\gamma)(\theta)$ $A_2 = +0.188$ *11*
$(ce_{LM}\ 0.164\gamma)(ce_L\ 0.133\gamma)(\theta)$ $A_2 = +0.138$ *12*
$(ce_K,\ ce_L,\ ce_M\ 0.164\gamma)(0.133\gamma)(\theta)$ is independent of chemical environment
$\gamma\gamma(\theta)$ $[A_2\ (solid)]/[A_2\ (liquid)] = 0.51$ *16*
$ce_K\gamma(\theta)$ $[A_2\ (solid)]/[A_2\ (theory)] = 0.47$ *3*

57C49 H.H.Coburn, J.V.Kane, S.Frankel, Phys. Rev. 105, 1293 (1957); 99, 671A (1955).

$Hg^{198}_{80\ 118}$ Level $Hg^{(198)}(\gamma,\gamma)$ Au^{198} at 1125°C
(0.411) J = 2 $\gamma\gamma(\theta)$
$\tau = 21^{\mu\mu s}$ *2*

τ(half-life) calc. using $\alpha = 0.04$ for 0.411γ

56M80 F.R.Metzger, J. Franklin Inst. 261, 219 (1956); Phys. Rev. 97, 1258; 98, 1186A (1955); F.R.Metzger, W.B.Todd, Phys. Rev. 95, 853 (1954).

Level $Hg^{(198)}(p,p'\gamma)$ $E_p = 3.2$; scin
(0.411) $\tau = 49^{\mu\mu s}$ *25* $(\alpha = 0.04)$
Yield corrected for anisotropy

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

$Hg^{199}_{80\ 119}$ Ground state
μ **+0.532** S

57B100 J.Blaise, H.Chantrel, J. phys. radium 18, 193 (1957).

$Hg^{199}_{80\ 119}$ Level $Hg^{(199)}(\gamma,\gamma)$ Au^{199} at 1000°C
(0.209) $\tau = 53^{\mu\mu s}$ *17*

τ is half-life for level using the transition ratio $0.050\gamma/0.209\gamma = 0.20$ and $\alpha = 0.7$ for 0.209γ

56M79 F.R.Metzger, J. Franklin Inst. 261, 219 (1956); F.R.Metzger, W.B.Todd, Phys. Rev. 94, 794A (1954).

Level $Hg^{(199)}(\gamma,\gamma)$
(0.209) $\tau = 62^{\mu\mu s}$ *9*

τ is half-life for level. Used the transition ratio, $0.050\gamma/0.209\gamma = 0.20$, and $\alpha = 0.7$ for 0.209γ. Au^{199} source rotated to compensate for recoil.

57K37 V.Knapp, Proc. Phys. Soc. 70A, 142 (1957).

Reaction γ's $Hg^{199}(p,p'\gamma)$ $E_p = 3.2$
0.159 *4* $\epsilon B(E2) = 0.08$ *2* scin γ
0.209 *5* $\epsilon B(E2) = 0.04$ *1*

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

$Hg^{200}_{80\ 120}$ Level $Hg^{(200)}(p,p'\gamma)$ $E_p = 3.2$; scin
0.375 *7* $\tau = 72^{\mu\mu s}$ *20* $(\alpha = 0.05)$
Yield corrected for anisotropy

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Capture γ's $Hg^{(199)}$(th n,γ)
(Excitation = 7.1 Mev)

1.4 to 4†	**0.068** *3* (K x ray)	scin
45 *7*†	**0.372** *5*	

57E31 I.V.Estulin, L.F.Kalinkin, A.S. Melioransky, Nuclear Phys. 4, 91 (1957).

$Hg^{201}_{80\ 121}$ Ground state
$\mu(Hg^{201})/\mu(Hg^{199}) = -1.110$ *1* S
q **+0.50** *5*

57B100 J.Blaise, H.Chantrel, J. phys. radium 18, 193 (1957).

$Hg^{202}_{80\ 122}$ Level $Hg^{(202)}(\gamma,\gamma)$ Tl^{202} at 1000°C
(0.439) J = 2 $\gamma\gamma(\theta)$
$\tau = 23^{\mu\mu s}$ *5*

τ(half-life) calc. using $\alpha = 0.04$ for 0.439γ

56M78 F.R.Metzger, J. Franklin Inst. 261, 219 (1956); Phys. Rev. 98, 200 (1955).

$Hg^{202}_{80\ 122}$ Level $Hg^{(202)}(p,p'\gamma)$ $E_p = 3.2$; scin
(0.439) $\tau = 37^{\mu\mu s}$ *19* ($\alpha = 0.03$)
Yield corrected for anisotropy

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

$Hg^{203}_{80\ 123}$ 47^d
τ **46.91**^{d} *14* $Hg^{(202)}$ (pile n,γ)
Source purity checked by scin γ

56E14 G.G.Eichholz, J.V.Krzyzewski, Can. J. Phys. 34, 1167 (1956).

τ **47.1**^{d} *2* $Hg^{(202)}$(pile n,γ)
2 samples counted for 2 half-lives each

57T11 H.Thiry, Bull. Soc. Roy. Sci. Liège 26, 29 (1957).

τ **45.4**^{d} *5* $Hg^{(202)}$(pile n,γ) chem
1 sample counted for 4 half-lives ic γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

β^-	**0.225**		sl
$\gamma(Tl^{203})$	**0.278**	$\alpha_K = 0.16$ K/LM = 2.80	sl ce

55A54 T.Azuma, Bull. Naniwa Univ. 3A, 237 (1955).

$\beta\gamma$ delay $< 410^{\mu\mu s}$ scin

55B148 E.E.Berlovich, Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 343 (1955), Columbia Tech. Transl. p.305.

β^-(right circular γ)(θ) = 1 + (0.1 *3*)$\langle v/c \rangle \cos\theta$
γ ray polarization measured by scattering from magnetized iron

57B93 F.Boehm, A.H.Wapstra, Phys. Rev. 106, 1364 (1957).

$Hg^{205}_{80\ 125}$ 5.1^m

τ	**5.1**^{m} *1*		$Hg^{204}(n,\gamma)$
β^-	~**1.4**		a $\beta\gamma$
	~**1.6**		a
$\gamma(Tl^{205})$	**0.203**		sm ce

53B88 B.Burson, J.Cork, W.Jordan, ANL-5140 p.36 (1953).

$Tl^{?}_{81}$ 6.5^{ms}

τ	**6.5**^{ms} *5*	Tl(20-Mev p)
γ	~**0.9**	scin

56L46 O.L.Leipunskii, V.V.Miller, A.M. Morozov, P.A.Iampol'skii, Doklady Akad. Nauk SSSR 109, 935 (1956); Soviet Phys. Doklady 1, 505(1956).

$Tl^{195}_{81\ 114}$ 1.2^h g.s.

τ	**1.2**^{h} *1*		$17^m Pb^{195}$ source; ms
$\gamma(Hg^{195})$	**0.0370** *1*		sd ce

Study covered $E_{ce} = 0.02$ to 1.0

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Tl^{195}_{81\ 114}$ 3.5^s

			$17^m Pb^{195}$ source
τ	**3.5**^{s} *4*		decay of ~0.4γ's scin
$\gamma(Tl^{195})$	**0.0991** *1*	$L_2/L_3 = 1.52$**12*	sd ce

*Theoretical ratio for E3 is 1.42 *10*

57A54 G.Andersson, P.A.Tove, B.Jung, I.B. Svensson, Nuclear Phys. 3, 493 (1957).

$Tl^{196}_{81\ 115}$ 2.4^h

	extracted from Tl(45- to 115-Mev p)Pb chem		
τ	**2.4**^{h} *1*		confirmed with ms sample
$\gamma(Hg^{196})$	**0.4246** *8*	K/L = 4.4	sd ce

Excitation function indicates A < 198 and activity not observed in A = 197 ms sample

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Tl^{197}_{81\ 116}$ 2.8^h g.s.

	extracted from Tl(~100-Mev p)Pb chem; ms			
τ	**2.7**^{h} *2*			
$\gamma(Hg^{197})$			K/L	sd ce
	6*	**0.1335** *3*	0.4	$L_2/L_3 = 1.4$ E2
				L_2:M:N = 52:20:10
	100*	**0.1517** *3*	5.2	No L_3
	2*	**0.1731** *3*	5	L:M:N = 6:2:1

Study covered $E_{ce} = 0.02$ to 1.0
*Relative ce_K intensities

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Tl^{197}_{81\ 116}$ 0.54^s

			$42^m Pb^{197}$ source
τ	**0.55**^{s} *10*		decay of 0.222γ scin
$\gamma(Tl^{197})$	**0.22245** *5*	K/L = 0.242**18*	sd ce
		$L_{12}/L_3 = 2.43$**15*	E3

*Theoretical values 0.246 *10*, 2.59 *10* respect.

57A54 G.Andersson, P.A.Tove, B.Jung, I.B. Svensson, Nuclear Phys. 3, 493 (1957).

$\gamma(Tl^{197})$				$42^m Pb^{197}$ source
		K/L	L_{12}/L_3	sd ce
100*	**0.2219** *4*	0.28	2.5	E3
88*	**0.3848** *8*	5.7$^\delta$		M1 + E2
56*	**0.3867** *8*	3.5		M1 + E2

Study covered $E_{ce} = 0.02$ to 1.0
*Relative ce_K intensities
$^\delta K/L_{12}$

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Tl^{197}_{81\ 116}$ 2.7^h ground state Au^{197}(48-Mev α,4n) chem

J	1/2	M

57B132 G.O.Brink, J.C.Hubbs, W.A.Nierenberg, J.L.Worcester, Phys. Rev. 107, 189 (1957).

Tl^{198} 81 117 1.9^h

Hg(30-Mev p,n) chem

$\gamma(Hg^{198})$ **0.04776** sd ce

	experiment	tneory (E2)
L_1/L_2	0.025 *8*	0.023
L_1/L_3	0.026*8	0.023
L_{12}/L_3	1.05 *8*	1.04
M_2/M_3	1.01 *10*	0.94
L/M	3.43 *25*	2.31$^{\$}$

γ assigned to Hg from M - L energy difference
*Indicates E2/M1 $\geq$19
$Screening included in theoretical values for α_L but not for α_M

57A55 G.Andersson, I.Bergström, Nuclear Phys. 3, 506 (1957).

Tl^{198} 81 117

1.9^h level Au^{197}(48-Mev α,3n) chem

J **7** M

57B132 G.O.Brink, J.C.Hubbs, W.A.Nierenberg, J.L.Worcester, Phys. Rev. 107, 189 (1957); Bull. Am. Phys. Soc. 1, No. 7, 343 R2 (1956).

Tl^{199} 81 118

7.4^h ground state Au^{197}(48-Mev α,2n) chem

J **1/2** M

57B132 G.O.Brink, J.C.Hubbs, W.A.Nierenberg, J.L.Worcester, Phys. Rev. 107, 189 (1957); Bull. Am. Phys. Soc. 1, No. 7, 343 R2 (1956).

Tl^{200} 81 119 26^h

extracted from Tl(65-Mev p)Pb chem,

τ **26.1^h** *4* Au^{197}(35-Mev α,n) chem

β^+	~6$^{\$}$	**0.460** *25*		sl
	73$^{\$}$	**1.052** *10*		
	13$^{\$}$	**1.436** *10* $\Delta J = 2$,yes shape		

$^{\$}\beta^+$ per 1000 ce$_K$ 0.368γ

$\gamma(Hg^{200})$			K/L	sd ce, scin
>30	*	**0.1165** *1*	>1.3	α_K♦
<9†	48 *5**	**0.2520** *2*	5.1 *8*	>0.2
<4†	55 *5**	**0.2893** *2*	3.4 *6*	>0.5
<20†	18 *3**	**0.3093** *2*	5.2 *10*	>0.034
1000†	1000 *	**0.3680** *2*	2.5 *3*	(0.0391)
140†	59 *5**	**0.5794** *3*	3.7 *6*	{0.0166
	13 *2**	**0.6289** *5*	6.4 *10*	{0.010■ *2*
	3 *1**	**0.7122** *4*	>5	
	8 *2**	**0.7873** *5*	>5	
70†	64 *7**	**0.8286** *4*	4.8 *7*	0.035 *10*
300†	{69 *7**	**1.2068** *5*	3.8 *7*	
	9 *2**	**1.2269** *7*	4.5	0.004■ *1*
	10 *2**	**1.3643** *10*		
~20†	5 *1**	**1.5167** *8*		0.010 *5*

No ce$_K$ 0.947γ (<0.5*) No ce$_K$ 1.885γ (<0.3*)
No 0.947γ (<7†) No 1.885γ (<1†)
Weak 0.0814, 0.3015, 0.3050 ce's and 0.5916 and 0.6616γ's also observed sd ce
*Relative ce$_K$ intensities
♦From ce$_K/\gamma$ if α_K =0.0391 for 0.3680γ
■From (ce$_K$)(ce$_K$)/ce$_K$ and α_K of 0.3680γ
(ce 0.252γ)(~1.22, 1.36, 1.52γ) sl ce,scinγ
For (ce)(ce) coincidences see card 56-12-113
No delayed coincidences
A decay scheme is proposed

57H43 C.J.Herrlander, T.R.Gerholm, Nuclear Phys. 3, 161 (1957); Phil. Mag. 46, 65 (1955)

Tl^{200} 81 119 26^h

γ_a \ γ_b	0.2520	0.2890	0.3092	0.3680	0.5794	0.7121	0.7853	0.8286	1.2067	1.2269	1.3623	1.5167
0.2520		Y?	N	Y	N		N	N	N	N?	N?	
0.2890	Y?			Y					N	Y		
0.3092	N			Y				N	Y	N		
0.3680	Y	Y	Y		Y			Y		Y	Y	Y
0.5794	N			Y		Y?	Y	Y				
0.7853								N				

Coincidences observed (Y), not observed (N) between (ce γ_a)(ce γ_b) (sl ce)(sl ce)

Decay scheme is proposed

56G44 T.R.Gerholm, Arkiv Fysik 11, 55 (1956)

Tl^{203} 81 122

Level $Tl^{(203)}(\gamma,\gamma)$ Hg^{203} at 1030° C
(0.279) τ =266$^{\mu\mu s}$ *45*

τ(half-life) calc. using α = 0.22 for 0.279γ

56M77 F.R.Metzger, J. Franklin Inst. 261, 219 (1956); F.R.Metzger, W.B.Todd, Phys. Rev. 95, 627A (1954).

Tl^{204} 81 123 4^y

τ **3.56^y** *5* $Tl^{(203)}$(pile n,γ) chem

57M47 W.F.Merritt, P.J.Campion, R.C.Hawkings, Can. J. Phys. 35, 16 (1957).

β^- **0.765** *5* $\Delta J = 2$,yes shape s
Corrected F-K plot shows an excess of counts for E_β <0.32. Source density 0.1 mg/cm^2.
ϵ_K/β^- =0.050 *5* scin

56B147 E.E.Berlovich, D.M.Khai, A.V. Savateev, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 275 (1956); Columbia Tech. Transl. p.259.

Tl^{204} 81 123

4^y ground state $Tl^{(203)}$(pile n,γ)

J **2** M

$|\mu|$ **0.0894** *20*

57B132 G.O.Brink, J.C.Hubbs, W.A.Nierenberg, J.L.Worcester, Phys. Rev. 107, 189 (1957); Bull. Am. Phys. Soc. 1, No. 7, 343 R2 (1956); 2, No. 4, 200 KA10 (1957).

4^y ground state

J **2** M

$|\mu|$ **0.062** *6*

56B124 H.G.Bennewitz, W.Paul, P.Toschek, Z. Naturf. 11a, 956 (1956).

Tl^{208} 81 127 3.1^m

τ **3.100^m** *15* collected from Bi^{212}

57B05 D.L.Baulch, H.A.David, J.F.Duncan, Australian J. Chem. 10, 85 (1957).

No 3.2γ (ce$_K$ <0.02% of ce$_K$ 2.62γ) sl

57D03 H.Daniel, Z. Naturf. 12a, 194 (1957).

$_{81}Tl^{208}_{127}$ 3.1^m

No 3.2γ ($<0.1\%$ of 2.62γ) sm Cp

55M98 D.G.E.Martin, G.Parry, Proc. Phys. Soc. 68A, 1177 (1955).

$_{81}Tl^{210}_{129}$ 1.3^m

τ $1.6^m 3$ collected from Bi^{214}

Neutrons observed with above half-life in 0.02% of Tl^{210} decays.* Not due to (γ,n) or (α,n) reactions.

$E_{dis}(Tl^{210}) = 5.39$, $S_n(Pb^{210}) = 5.24^\$$

*~ 3 neutrons per sec per mC of Rn^{222} source

56K45 A.V.Kogan, Doklady Akad. Nauk SSSR 108, 817$_\delta$(1956); Soviet Phys. Doklady 1, 372 (1957); $^\$$J.R.Huizenga, Physica 21, 410 (1955).

$27^m Pb^{214}$ source

No 4.3β ($<0.5\%$) sl

57D03 H.Daniel, Z. Naturf. 12a, 194 (1957).

$_{82}Pb$

Relative isotopic abundances ms

Pb^{204}	1.37%	Pb^{207}	21.2%
Pb^{206}	25.0%	Pb^{208}	52.4%

$Pb^{204}/Pb^{206} = 0.0550\ 2$

$Pb^{207}/Pb^{206} = 0.8500\ 8$

$Pb^{208}/Pb^{206} = 2.100\ 4$

55E17 H.P.Ehrenberg, J.Geiss, R.Taubert, Z. Angew. Phys. 7, 416 (1955); Z. Naturf. 9a, 218 951 (1954).

τ 1 to 2^h Tl($\leq$ 115-Mev p) chem

Possible interpretation of some weak ce sd ce

γ(Tl)	0.267	1.132	K/L~6
γ(Hg)	0.041		
	0.042	0.064	

Unassigned ce: 0.0431, 0.0902, 0.1054, 0.154, 0.676, 0.682, 0.753, 0.852, 0.916, 1.011, 1.027, 1.032, 1.151, 1.293

τ $<1^h$

Unassigned ce: ~0.041, ~0.042, 0.107, 0.1765, 0.1792

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

τ 2 to 3^h Tl($\leq$115-Mev p) chem

Possible interpretation of some weak ce

γ(Tl)			sd ce	
	0.146	K/L		K/L
	0.276	~2	0.576	~2.5
	0.420	~2.5	0.606	~2
γ(Hg)	0.269	~2		
	0.583	3.2	0.611	~1

Unassigned ce: 0.3515, 0.3925, 0.5050, 0.554, 0.6051, 0.6570

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$_{82}Pb^{195}_{113}$ 17^m

τ 17^m 1 Tl(~100-Mev p) chem; ms

$\gamma(Tl^{195})$ 0.099* sd ce

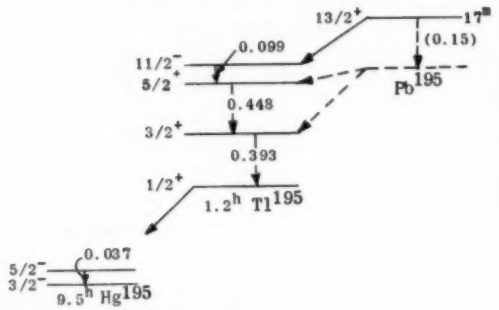
$L_{12}:L_3:M:N = 100:57:36:13$

0.3931 8 K/L~3

0.4475 9

Study covered $E_{ce} = 0.02$ to 1.0

*Conversion in Pb is possible



57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$_{82}Pb^{196}_{114}$ 37^m

τ 37^m 3 Tl(~100-Mev p) chem; ms

$\gamma(Tl^{196})$ sd ce

19* 0.1668 3 K/L~1

100* 0.2529 5 K/L = 4.7

(ce 0.169γ)(ce 0.253γ) sl

p $2.4^h Tl^{196}$ (growth and decay of 0.425γ)

Study covered $E_{ce} = 0.02$ to 1.0

*Relative ce_K intensities

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$_{82}Pb^{197}_{115}$ 42^m

τ 42^m 2 Tl(100-Mev p) chem; ms

$\gamma(Pb^{197})$ 0.2340 5 $L_{12}/L_3 = 1.5$ M4 sd ce

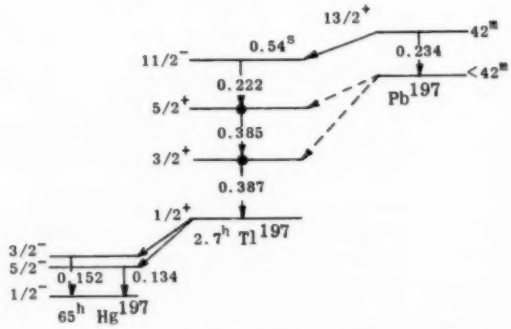
K/L > 0.3 M/N = 3.5

(ce_K 0.222γ of $0.54^s Tl^{197}$)/(ce_K 0.234γ) = 1.3 gives $\epsilon/IT = 4.2$ 3

No 0.169γ (now assigned to $37^m Pb^{196}$

Study covered $E_{ce} = 0.02$ to 1.0

g.s. decay not observed



57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Pb^{198}_{82\ 116}$ 2.4^h

τ **2.4^h** 2 Tl(60-Mev p) chem; ms

$\gamma(Tl^{198})$ K/L sd ce

85*	**0.1169** 2	~4	
61*	**0.1734** 3	0.65	L_{12}/L_3 = 1.2
			L_2:M:N = 4:2:1
54*	**0.2593** 5	~3	K/M~5
100*	**0.2904** 6		No L_3
100*?	**0.3655** 7	>2?	
19*	**0.3820** 8		K/M~17
10*	**0.3978** 8	2	

(ce 0.365γ)(ce 0.398γ) sl

*Relative ce_K intensities

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Pb^{198}_{82\ 116}$

Tl(~60-Mev p) chem; ms

No evidence for a 25^m activity at A = 198

No 1.8^h Tl^{198} ce observed

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Pb^{199}_{82\ 117}$ 1.5^h g.s.

τ **1.5^h** 2 Tl(~80-Mev p) chem; ms

β^+ **2.8** sd

$\gamma(Tl^{199})$ K/L L_{12}/L_3 sd ce

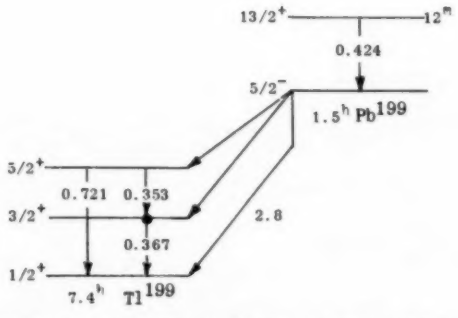
39*	**0.3528** 7	5.3	40	M1 + E2
100*	**0.3670** 7	4.4	7.4	M1 + E2
2*	**0.7210** 14			

(ce 0.353γ)(ce 0.367γ) sl

(ce_K 0.353γ)/β^+ ~3

Study covered E_{ce} = 0.02 to 1.0

*Relative ce_K intensities



57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Pb^{199}_{82\ 117}$ 12^m

τ **12.2^m** 3 Tl(~80-Mev p) chem; ms

$\gamma(Pb^{199})$ **0.4241** 8 K/L = 1.9 sd ce

L_{12}/L_{13} = 3.2 M4

No other γ with E_γ > 0.03 sd ce, scin

57A53 G.Andersson, E.Arbmen, B.Jung, Arkiv Fysik 11, 297 (1957).

τ **13^m** 1 d $25^m Bi^{199}$ chem

$\gamma(Pb^{199})$ **0.41** 3 α_K = 2.4 10 M4 scin x/γ

No other γ with E_γ > 0.04 scin

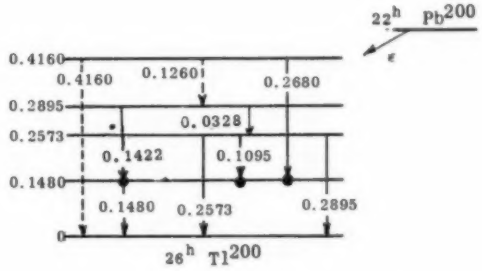
56S105 R.Stockendal, J.A.McDonell, M. Schmorak, I.Bergstrom, Arkiv Fysik. 11, 165 (1956).

$Pb^{200}_{82\ 118}$ 22^h

(sl ce)(sl ce)

(ce 0.1480γ)(ce 0.1095, 0.1422, 0.2353, 0.2680γ)

No (ce 0.1480γ)(ce 0.1589, 0.2573, 0.2895γ)



56G44 T.R.Gerholm, Arkiv Fysik 11, 55 (1956).

$Pb^{201}_{82\ 119}$ 9.4^h g.s.

β^+ ~2.5 Tl(~65-Mev p)Pb chem; sd

Assignment is tentative

57A53 G.Andersson, E.Arbman, B.Jung, Arkiv Fysik 11, 297 (1957).

$Pb^{201}_{82\ 119}$ 61^s

τ **61^s** 2 d $1.85^h Bi^{201}$ chem

$\gamma(Pb^{201})$ **0.629** 1 Bi^{201} source sd ce

K/L = 2.3 3 L_{12}/L_3 = 4 1

α_K = 0.6* 2 M4 scin x/γ

No other γ with E_γ > 0.04

*Measured with $61^s Pb$ source

56S105 R.Stockendal, J.A.McDonell, M. Schmorak, I.Bergstrom, Arkiv Fysik 11, 165 (1956).

$Pb^{202}_{82\ 120}$ 3.6^h

γ(0.4598γ) delay = 475$^{\mu s}$ 20

57T25 P.A.Tove, quoted by McDonell et al., Nuclear Phys. 3, 513 (1957).

Pb^{202} 82 120 3.6^h

ϵ 9.7% from relative γ intensities of Tl^{202}, Pb^{202} and Hg^{202}, Pb^{202}

$\gamma(Pb^{202})$				K/L	L_{12}/L_3	
E4	690* 50	L	0.1293	< 0.008	1.88 12	$L_1 \ll L_2$
M1	4.0* 3	K	0.2403	5.0 6		
E2	66* 5	K	0.4221	2.6 3	5.6 8	$L_1 \sim L_2$
E5	1.1* 1	L	0.5472	0.8^{+1}_{-3}	6.0 15	
E1	4.4* 4	K	0.6576	5.5 7		$L_2 \ll L_1$
E5	100*	K	0.7872	1.2 1	~10	
E2	13* 1	K	0.9614	5.0 7	~15	

No 0.4173, 1.3835γ sm, sd ce

$\alpha_K(0.787\gamma) = 0.091$ 14

$(ce_K\ 0.787\gamma)(ce_K\ 0.422\gamma)$ sd ce

$(ce_L\ 0.547\gamma)(ce_L\ 0.422\gamma)$

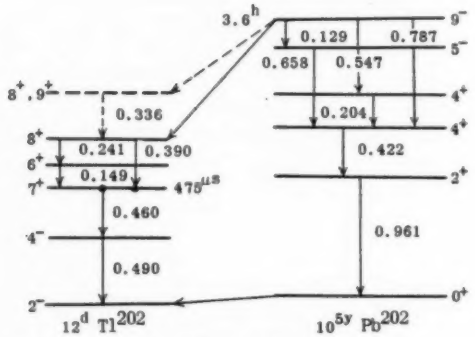
*Relative ce intensities for indicated shell

$\gamma(Tl^{202})$				K/L	L_{12}/L_3	
M1	17* 3	K	0.1489	6.1 12		$L_3 \ll L_1$
E2	2.5* 2	K	0.2411	1.3 2	2.5 3	
	1.3* 1	K	0.3356	~5		
M1	28* 3	K	0.3899	6 3		
E3	9* 1	L	0.4598	< 1.7	5.1 5	
E2	1.7* 2	L	0.4904	3.5 10	8 2	

No 0.4013γ

No $(ce_K\ 0.3899\gamma)(ce_K\ 0.4598, ce_K\ 0.4904\gamma)$

*Relative ce intensities for indicated shell



57M40 J.A.McDonell, R.Stockendal, C.J. Herrlander, I.Bergström, Nuclear Phys. 3, 513 (1957).

Pb^{203} 82 121 52^h g.s.

$(0.404\gamma)(0.279\gamma)(\theta)$ J = 3/2 or 5/2, 3/2, 1/2 $\eta(\pi) = -0.181$ 7 scin

J(0.683 level)	$\delta(0.404\gamma)$*
3/2	−0.108 11 or −14.3 9
5/2	+0.025 6 or −5.24 18

$\alpha_K(0.404\gamma) = 0.15$ (calc. from either low value of δ using theoretical α_K's of Sliv)

$\alpha_K(0.404\gamma) = 0.115$ 15 (experimental value)**

*If $\delta(0.279\gamma) = +1.45$ 7

57N15 B.Van Nooijen, A.H.Wapstra, Physica 23, 404 (1957); **Nijgh et al. ibid.

$(0.404\gamma)(0.279\gamma)(\theta)$ $\eta(\pi) = -0.205$ 5 scin

Graph of $a(0.279\gamma)$ vs $a(0.404\gamma)$ given for above $\eta(\pi)$ with J = 5/2, 3/2, 1/2

$a = E2/(E2 + M1)$

57L34 T.Lindqvist, I.Marklund, Nuclear Phys. 3, 367 (1957).

Pb^{203} 82 121 6.5s

τ 6.5s 5 d $12^h Bi^{203}$ chem

$\gamma(Pb^{203})$ 0.8252 5 Bi^{203} source sd ce

$K/L_{12} = 3.3$

$\alpha_K^* \geq 0.2$ M4 scin x/γ

No other γ with $E_\gamma > 0.04$

*Measured with 6.5sPb source

56S105 R.Stockendal, J.A.McDonell, M. Schmorak, I.Bergström, Arkiv Fysik 11, 165, 132A (1956).

Pb^{204} 82 122 68m

τ 67.5m 5 d $12^h Bi^{204}$ chem

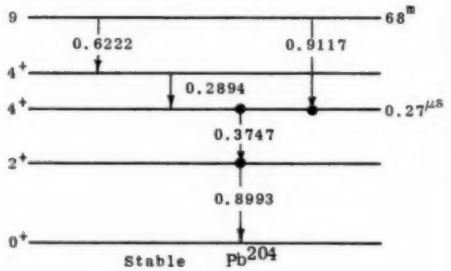
$\gamma(Pb^{204})$			
19*	0.2894 2	Tl(25-Mev d) chem	
830*†	0.3747 4	M3/E2 = 0.003 2 from $\alpha_K = 0.0444^{\$}$ 29	sd ce
7.0*	0.6222 2	K/L = 0.74 9	
130*	0.8993 3	K/L = 3.9 4	
1000*	0.9117 3	M6/E5 < 0.005 from $\alpha_K = 0.0549^{\$}$20	

K/L = 1.7 8 $L_{12}/L_3 = 11$ 2

$^{\$}$Used $[\alpha_K(E2)\ 0.899\gamma] = 0.00653$ (Sliv calc.)

†If $(ce_K\ 0.899\gamma + ce_K\ 0.912\gamma) = 1.35(ce_K\ 0.375\gamma)$

*Relative ce_K intensities



56H50 C.J.Herrlander, R.Stockendal, J.A. McDonell, I.Bergström, Nuclear Phys. 1, 643 (1956).

Pb^{205} 82 123

No M4 isomeric activity observed Bi^{205} chem

From systematics expected $E_\gamma = 0.98$, $\tau = 1.5^s$

56S105 R.Stockendal, J.A.McDonell, M. Schmorak, I.Bergström, Arkiv Fysik. 11, 165 (1956).

Pb^{207} 82 125 0.82s

τ 0.84s 2 d 8.0y Bi^{207} chem

56C50 E.C.Campbell, F.Nelson, J. Inorg. Nucl. Chem. 3, 233 (1956).

Pb^{207} 82 125

Levels $Pb^{206}(d,p)$ $E_d = 10.8$

g.s.	Q = +4.51	sd 12° to 140°
0.57 2		
0.90 2		3.61 2
1.63 2		4.37 2
2.35 2		4.62 2
2.71 2		5.20 2

57M36 M.T.McEllistrem, H.J.Martin, D.W. Miller, M.B.Sampson, Bull. Am. Phys. Soc. 2, No. 4, 208 P11 (1957); verbal report.

$Pb^{207}_{82\ 125}$ Reaction γ $Pb^{(207)}(N^{14},N^{14'}\gamma)$ $E_{N14}=15.6$
0.580 *10* scin

56A36 D.G.Alkhazov, D.S.Andreyev, A.P.Greenberg, I.M.Lemberg, Nuclear Physics 2, 65 (1956); Physica 22, 1129A (1956); Zhur. Eksptl. i Teoret.Fiz. 30, 809 (1956).

$Pb^{210}_{82\ 128}$ 19^{y} τ **19.40**^{y} *35* differential ic

55T14 J.Tobailem, J. phys. radium 16, 235 (1955); Ann. phys. 10, 783 (1955).

β^- chemically pure Pb^{210}
84.5 *35%* **(0.018)** ppl
15.5 *35%* **(0.065)**
(ce 0.046γ)/β = 0.81 *4*

56S99 W.Stanners, M.A.S.Ross, Proc. Phys. Soc. 69A, 836 (1956).

$\gamma(Bi^{210})$ carrier free RaDEF source
4.5 *4*† **(0.047)** α_L = 13.3$^{\bullet}$ *20* scin
x 23.8 *20%* **L x ray** pc
(L x ray)/(0.047γ) = 5.1 *7* pc
†Photons per 100 Po^{210} α's
$^{\bullet}$From (L x ray/(0.047γ) = 5.1 *7* if ω_L = 0.38 *2*

57F06 R.W.Fink, Phys. Rev. 106, 266 (1957); Bull. Am. Phys. Soc. 2, No. 2, 103 J1 (1957).

$Pb^{212}_{82\ 130}$ 11^{h} source from $1.9^{y}Th^{228}$ recoils
$\gamma(Bi^{212})$ **0.1147** sd ce_K
$\gamma(Tl^{208})$ **0.0399** (from Bi^{212} decay) sd ce_{L1}
$(ce_{L1}\ 0.040\gamma)/(ce_K\ 0.115\gamma)$ = 1.2
$\Gamma(ce_K\ 0.115\gamma)$ = 97$^{\bullet}$ev
$\Gamma(ce_{L1}\ 0.040\gamma)$ = 50$^{\bullet}$ev
Calculated $\Gamma_K - \Gamma_{L1} \sim 50$ ev
$^{\bullet}$Not corrected for sd resolution

56K50 E.M.Krisiuk, G.D.Latyshev, A.G.Sergeev, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 367 (1956); Columbia Tech. Transl. p.335.

source from $1.9^{y}Th^{228}$ recoils
$\gamma(Bi^{212})$ **(0.115)** K/L = 5 *1* (γ)(ce)
(0.299 γ)(ce 0.115γ) scin γ, sl ce

57N11 K.O.Nielsen, O.B.Nielsen, M.A.Waggoner, Nuclear Phys. 2, 476 (1957).

$\gamma(Bi^{212})$ **(0.238)** $M_1:M_2$ = 1000:118 *3* sd ce
$L_1:L_2:L_3$ = 1000:116 *3*:6.6 *4*

56K49 E.M.Krisiuk, G.D.Latyshev, M.A.Listengarten, L.A.Ostretsov, E.G.Sergeev, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 363 (1956); Columbia Tech. Transl. p.332.

$Pb^{212}_{82\ 130}$ 11^{h} $\Gamma(ce_K\ 0.238\gamma)$ = 67 *2* ev sd ce
Ascribed to width of atomic K level (see M.Mladjenovic, Arkiv Fysik 8, 27, 1954)

56L47 G.D.Latyshev, A.G.Sergeev, E.M.Krisiuk, L.A.Ostretsov, I.S.Egorov, N.M.Shirshov, Izvest. Akad. Nauk Ser. Fiz. SSSR 20, 354 (1956); Columbia Tech. Transl. p.324.

$Pb^{214}_{82\ 132}$ 27^{m} $3.8^{d}Rn^{222}$ source
$\gamma(Bi^{214})$ **(0.053)** L_1/L_2 = 10 *3* sl ce
L_1/L_3 = 85 *15* E2 < 0.2%
570 *15*$^{\bullet}$ **(0.242)** K/L = 5.30 *15* E2 < 10%
K/LM = 4.2
α_K = 0.63
785 *20*$^{\bullet}$ **(0.295)** K/L = 5.55 *15* E2 < 10%
1000 $^{\bullet}$ **(0.352)** K/L = 5.65 *15* E2 < 10%
Also 0.206, 0.259, 0.275, 0.480, 0.534, and 0.780 γ's with combined intensity of ~2% and 0.196, 0.272, 0.279, 0.549 γ's ~0.2%
(ce 0.053γ)/(ce_K 0.242γ) = 2.8
$^{\bullet}$Relative ce_K intensities

57N11 K.O.Nielsen, O.B.Nielsen, M.A.Waggoner, Nuclear Phys. 2, 476 (1957).

$Bi^{201}_{83\ 118}$ 1.85^{h} τ **1.85**^{h} *7* Pb(70-Mev p) chem
p $61^{m}Pb^{201}$ (0.629γ) sd ce

56S105 R.Stockendal, J.A.McDonell, M. Schmorak, I.Bergström, Arkiv Fysik. 11, 165 (1956).

$Bi^{202}_{83\ 119}$ 95^{m} $\gamma(Pb^{202})$ Pb(70-Mev p) chem
39 *4*$^{\bullet}$ **(0.4221)** sd ce
10 $^{\bullet}$ **(0.9614)**
$^{\bullet}$Relative ce_K intensities

57M40 J.A.McDonell, R.Stockendal, C.J. Herrlander, I.Bergström, Nuclear Phys. 3, 513 (1957).

$Bi^{205}_{83\ 122}$ 14.5^{d} β^+ **0.925** *30* Pb(25-Mev d) chem; sd sm, sd ce; scin

$\gamma(Pb^{205})$					
100$^{\bullet}$	**0.1152**	240$^{\bullet}$	**0.5800**	325$^{\bullet}$	**1.0437**
80$^{\bullet}$	**0.2359**	67$^{\bullet}$	**0.6265**	76$^{\bullet}$	**1.1903**
1100$^{\bullet}$	**0.2605**	10$^{\bullet}$	**0.6889**	3$^{\bullet}$	**1.337**
410$^{\bullet}$	**0.2823**	1000$^{\bullet}$	**0.7033**	11$^{\bullet}$	**1.3515**
1600$^{\bullet}$	**0.2842**	21$^{\bullet}$	**0.7450**	4$^{\bullet}$	**1.5025**
280$^{\bullet}$	**0.3494**	31$^{\bullet}$	**0.7583**	8$^{\bullet}$	**1.5520**
60$^{\bullet}$	**0.3832**	20$^{\bullet}$	**0.7610**	31$^{\bullet}$	**1.6146**
110$^{\bullet}$	**0.4936**	98$^{\bullet}$	**0.9108**	436$^{\bullet}$	**1.7664**
220$^{\bullet}$	**0.5117**	275$^{\bullet}$	**0.9878**	52$^{\bullet}$	**1.7774**
63$^{\bullet}$	**0.5500**	21$^{\bullet}$	**1.0027**	20$^{\bullet}$	**1.8633**
740$^{\bullet}$	**0.5710**	49$^{\bullet}$	**1.0142**	6$^{\bullet}$	**1.9065**
$^{\bullet}$Relative ce_K intensities				<5$^{\bullet}$	**2.60**

0.260 K/L_{12} = 3.4 *6* $L_1/L_2 = 5^{+4}_{-2}$
0.282 K/L_{12} = 5.5 *10*
0.284 $K:L_{12}:M_1$ = 53:10:2 $L_1:L_2:L_3$ = 6:1:0

Continued

Bi^{205} 83 122 14.5^{d} $\gamma(Pb^{205})$ Continued

	α_K	K/L		α_K	K/L
0.349	>0.03	5.9 5			
0.512	>0.03	6.0 *15*	0.988	~0.002	4.0 5
0.571	0.05	5.5 5	1.044	~0.02	5.7 2
0.580	>0.03	7.0 *25*	1.190		3.8 5
0.703	0.01	4.2 *1*	1.615		7.0 *15*
0.911		4.0 *2*	1.766		6.0 *3*

No γ with $E_\gamma > 2.6$ scin

$\gamma^{\pm}(ce_K\ 0.703\gamma)$ scin γ, sl ce

γ_a \ γ_b	0.260	0.282	0.284	0.349	0.512	0.571	0.580	0.703	0.911
0.282	} Y		Y	N	} Y	} Y			
0.284	}	Y		N	}	}	Y	N	
0.349	Y	N	N			Y	N	Y	
0.571	Y			Y			Y?	N	
0.703	N		Y	Y		N			Y
0.988	N								
1.044	N	N	N	N					
1.766	N		N	N				N	
1.777	N			N				N	

Coincidences observed (Y), not observed (N) between (ce γ_a)(ce γ_b) sl

γ_a \ γ_b	0.260	0.282	0.284	0.349	0.512	0.571	0.703	0.988	1.044
0.703			Y					N	N
0.912							Y		
1.615	Y							N	
1.766	N	N	N			N	N	N	N
1.777	N	N	N			N	N		N
1.863	N	N	N			}	} Y		
1.906	N	N	N			}	}		

Coincidences observed (Y), not observed (N) between (γ_a)(ce γ_b) (scin γ)(sl ce)

Proposed decay scheme accommodates 28 γ's

56S118 M.Schmorak, R.Stockendal, J.A.McDonell, I.Bergström, T.R.Gerholm, Nuclear Phys. 2, 193 (1956).

$\gamma(Pb^{205})$				
1000†	K x ray	77†	**0.910** *10*	scin
28†	**0.280** *10*	202†	**0.990** *10*	
8.6†	**0.330** *15*	179†	**1.040** *15*	
4†	**0.383** *15*	35†	**1.182** *15*	
~50†	**0.518** *15*	~20†	**1.350** *30*	
~100†	**0.570** *15*	30†	**1.515** *20*	
22†	**0.621** *15*	64†	**1.620** *20*	
345†	**0.703**	413†	**1.757** *15*	
~70†	**0.755** *15*	101†	**1.870** *20*	

(1.870γ)(0.703γ, not K x ray, $E_\gamma > 0.703$)

(0.703γ)(0.280, 0.910γ, not 1.757γ)

57V16 S.H.Vegors, Jr., R.L.Heath, Bull. Am. Phys. Soc. 2, No. 4, 232 W7 (1957); verbal report.

Bi^{205} 83 122 14.5^{d}

γ_a \ γ_b	0.7033	1.6146	1.7664	1.7774	1.8633	1.9065
0.2605		Y	N	N	N	N
0.2823			N	N	N	N
0.2842	Y		N	N	N	N
0.3494			N			
0.5117			N			
0.5710			N	N		
0.7033	Y		N	N	⌣ Y	
0.9878		N	N	N	N	N
1.0437			N	N	N	N

Coincidences observed (Y), not observed (N) between (ce γ_a)(photon γ_b) (sl ce)(scin γ)

γ_a \ γ_b	0.2822	0.2823	0.2842	0.3494	0.5710	0.5800	0.7303	0.9108	0.9878	1.0437	1.7664	1.7774
0.2605	⌣ Y			Y	Y		Y?		N	N	N	N
0.2823		Y?	N							N		
0.2842	Y?		N			Y	N			N	N	
0.3494		N	N		Y	N	Y		N	N		
0.5117		⌣ Y					N					
0.5710		⌣ Y		Y	Y?	N						
0.7033			Y	Y	N			Y	N	N		

Coincidences observed (Y), not observed (N) between (ce γ_a)(ce γ_b) (sl ce)(sl ce)

Decay scheme is proposed

56G44 T.R.Gerholm, Arkiv Fysik 11, 55 (1956).

Bi^{206} 83 123 6.3^{d} τ **6.30^{d}**

57A61 E.Arbman, Nuclear Phys. 3, 625 (1957).

(0.184γ)(0.516γ) delay = **$123^{\mu s}$** 4

57T22 P.Tove, Nuclear Instr. 1, 95 (1957).

Bi^{207} 83 124 8^{y} $\gamma(Pb^{207})$

			α_K	K/LM	
43*	100†	**0.566** 4	0.019 *7*	3.3	scin
187*	74†	**1.06** *1*	0.114 45	3.8	
	10†	**1.76**			
x	80†	**K x ray**			

*Relative ce intensities

57R41 R.A.Ricci, Physica 23, 693 (1957).

Bi^{208} 83 125 3^{ms}

τ **2.0^{ms}** 5 from $Pb^{(208)}$(20-Mev p,n)
3.0^{ms} *10* from Bi^{209}(20-Mev p,pn)

$\gamma(Bi^{208})$ ~0.7 scin

56L46 O.I.Leipunskii, V.V.Miller, A.M. Morozov, P.A.Iampol'skii, Doklady Akad. Nauk SSSR 109, 935 (1956); Soviet Phys. Doklady 1, 505 (1956).

Bi^{209} 83 126

Levels $Bi^{209}(n,n')$ $E_n = 4.4$ ppl 82°

σ(mb/sr)	Level
185 40	g.s.
20 10	(0.895)
135 45	1.9 to 3.5

56W36 J.B.Weddell, Phys. Rev. 104, 1069 (1956).

Bi^{212} 83 129 60.5m

source from Th^{232} recoils

α 36.2 6% $(Bi^{212}\ 6.1\alpha)/(Po^{212}\ 8.8\alpha)$ ic

56S117 F.E.Senftle, T.A.Farley, N.Lazar, Phys. Rev. 104, 1629 (1956).

β⁻ a	b		log ft	$^{11}{}^{h}Pb^{212}$ source
5%	5%	0.085 5	4	sl, scin β(8.78α)
9%	8.5%	0.45 4	6.1	
6%	6%	0.67 5	6.7	
5.5%	7.5%	0.93	7.1	
8.5%	10%	1.55	7.9	Not ΔJ = 2, yes shape
66%	63%	2.27	7.6	

(1.34γ, not 0.84γ)(8.78α)

[a]%'s if 2.27β has allowed shape

[b]%'s if 2.27β corrected for ΔJ = 1, yes shape

57B134 J.Burde, B.Rozner, Phys. Rev. 107, 531 (1957); Bull. Research Council Israel 6A, 152A (1956).

γ(Po^{212}) $1.9^{y}Th^{228}$ source

0.73	1.50 scin
0.83?	1.67?
1.04	1.80
1.34	2.20

56C66 B.Chinaglia, F.Demichelis, Nuovo Cim. 4, 160 (1956).

γ(Po^{212}) $1.9^{y}Th^{228}$ source

35† 1.62 sπ Cp

No 1.1γ (<40†), 1.35γ (<20†), 1.5γ (<15†), 1.8γ (<10†), 2.2γ (<5†)

Study covered energy range from 1.0 to 3.5

†Photons per 1000 $3.1^{m}Tl^{208}$ 2.62 γ's

55M98 D.G.E.Martin, G.Parry, Proc. Phys. Soc. 68A, 1177 (1955).

(6.05 α)(ce 0.040γ) delay = $1.0^{\mu\mu s}$ 5 sl ce

Measured ce momentum as function of Tl^{208} recoil distance (0 to 7.4×10^{-5}cm)

56B126 J.Burde, S.G.Cohen, Phys. Rev. 104, 1093 (1956).

Bi^{213} 83 130 47m

β(0.437γ) delay <$2^{m\mu s}$ $10^{d}Ac^{225}$ source

56S123 D.Strominger, UCRL-3374 (1956).

Bi^{214} 83 131 20m

β⁻ 1.7 scin

2.6

3.2

(1.7, 2.6β)(0.61γ) scin

56B133 G.R.Bishop, F.Demichelis, Nuovo Cim. 4, 1599 (1956).

γ(Po^{214}) $3.8^{d}Rn^{222}$ source

			a_K[$]	K/L	sl ce
93	4*	(0.769)	0.0340	4.6 12	M1
16	4*	0.807	0.0086	3.0 15	E2
88	4*	(0.935)	0.0205	5.4 3	M1
280	10*	(1.120)	0.0127	5.6 2	M1
32	3*	(1.155)	0.0118		M1
103	5*	(1.238)	0.0098	5.7 3	M1

*Relative ce_K intensities

[$]If a_K = 0.0150 for 0.609γ (Sliv calc. for E2)

57N11 K.O.Nielsen, O.B.Nielsen, M.A.Waggoner, Nuclear Phys. 2, 476 (1957).

γ(Po^{214}) Ra^{226} source

100†	2.20 2	sl Cp
41†	2.45 2	
2.6†	2.72 2	
0.5†	2.89 5	
1.3†	3.03 3	

57D03 H.Daniel, Z. Naturf. 12a, 194 (1957).

(1.9 1β)(E_γ >0.5, not E_γ >0.8) sl β, scin γ

(0.5 2, 1.1 1, 1.45 5β)(E_γ >0.8)

(1.5 2β)(ce 0.609, 1.12γ) scin β, sl ce

(1.8 2β)(ce 1.416γ) scin β, sl ce

No 2.6β (<4%) sl β, scin E_γ >0.2

No (3.26β)γ

57N10 R.Nierhaus, H.Daniel, Z. Naturf. 12a, 1 (1957).

No βγ delay between $0.5^{\mu s}$ and $400^{\mu s}$

Only (>2.5β)α delay ($164^{\mu s}$) via Po^{214} observed

57K41 A.V.Kogan, I.A.Sokolov, Zhur. Eksptl'. i Teoret. Fiz. 31, 904 (1955); Soviet Phys. JETP 4, 767 (1957).

Po 84

Transylvanian ore chem

α weak ppl

x Po L_α x ray S

Po L_β x ray

Interpreted as evidence for new long-lived Po

55R56 R.Ripan, R.Paladi, H.Hulubei, Proc. Internat. Conf. Peaceful Uses Atomic Energy (Geneva) 7, 392 (1955).

Po^{196} 84 112 1.9m

τ 1.9m W(200-Mev Ne^{20}) chem

α 6.14

56A45 H.Atterling, W.Forsling, B.Åström, Physica 22, 1193A (1956).

$Po^{202}_{84\ 118}$ 51^m 3

τ 51^m 3 — 6.5^m Rn^206 source
α 2%* 5.57 5 — ic
*From (Po^{202} 5.57α)/(Rn^{206} 6.25α)

57S100 A.W.Stoner, E.K.Hyde, J. Inorg. Nuclear Chem. 4, 77 (1957).

$Po^{204}_{84\ 120}$ 3.8^h

τ 3.5^h 6 — Pt(110-Mev N^{14}) chem
α 5.35 5 — ic

56B112 W.E.Burcham, B.C.Haywood, Proc. Phys. Soc. 69A, 862 (1956).

$Po^{206}_{84\ 122}$ 8.8^d

τ 8.83^d — Bi^{209}(50-Mev p,4n) chem
No β^+ (<0.1%) — sd
$\gamma(Bi^{206})$ 0.0599 $L_1:L_2:L_3 = 3:108:100$ $M_1:M_2:M_3:M_{4,5} = \leq 5:102:100:\leq 4$
authors table 1 lists 25 additional γ's and gives $ce_K/100\beta$, K/L, L/M, and L_{12}/L_3
The following γ's are not included in the proposed decay scheme: 0.0829, 0.1176, 0.1406, 0.4635, 0.6456, 0.6778
No γ with $E_\gamma > 1.32$ — scin, sd ce
Author's Table 2 lists 30 unassigned ce's
Authors Table 5 lists all 31 (ce)(ce) data

57A61 E.Arbman, Nuclear Phys. 3, 625 (1957).

$Po^{210}_{84\ 126}$ 138^d

τ 138.5^d — pure Po^{210} source
$\gamma/\alpha = 1.2 \times 10^{-5}$ 2 — GM γ, calorimeter α
Used Co^{60} for γ calibration

56S124 N.S.Shimanskaia, Zhur. Eksptl.' Teoret. Fiz. 31, 174 (1956); Soviet Phys. JETP 4, 165 (1957).

$\gamma(Pb^{206})$ 0.755 — scin
$\gamma/\alpha = 1.21 \times 10^{-5}$ 8 — scin

56A46 A.Ascoli, M.Asdente, E.Germagnoli, Nuovo Cim. 4, 946 (1956).

$Po^{212}_{84\ 128}$ $0.30^{\mu s}$

Ground state — 60.5^m Bi^{212} source
J ≥1
(2.25 β)(8.78 α)(θ) η(π) = +1.0 — ppl
From analysis of 54 tracks

56B138 A.Beiser, Ann. New York Acad. Sci. 62, 423 (1956).

$At^{?}_{85}$

τ a few hours — Pt(110-Mev N^{14}) chem
α 5.1, 5.3, 5.5 — ic

56B122 W.E.Burcham, B.C.Haywood, Proc. Phys. Soc. 69A, 862 (1956).

$At^{203}_{85\ 118}$ 7^m

τ 7.1^m 15 — Pt(110-Mev N^{14}) chem
α 6.09 3 — ic

56B112 W.E.Burcham, B.C.Haywood, Proc. Phys. Soc. 69A, 862 (1956).

$At^{205}_{85\ 120}$ 26^m

τ 22.7^m 40 — Pt(110-Mev N^{14}) chem
α 5.94 3 — ic

56B112 W.E.Burcham, B.C.Haywood, Proc. Phys. Soc. 69A, 862 (1956).

$At^{207}_{85\ 122}$ 1.8^h

τ 1.78^h 8 — 10^m Rn^{207} source
α 5.75 5 — ic
d 10^m Rn^{207} from growth and decay of 5.75α

57S100 A.W.Stoner, E.K.Hyde, J.Inorg. Nuclear Chem. 4, 77 (1957).

τ 1.4^h 1 — Pt(110-Mev N^{14}) chem
α 5.76 4 — ic

56B112 W.E.Burcham, B.C.Haywood, Proc. Phys. Soc. 69A, 862 (1956).

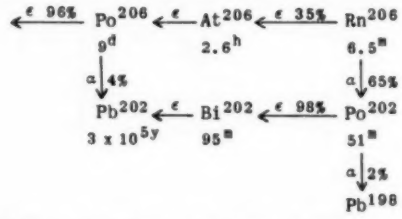
$Rn^{204}_{86\ 118}$ 3^m

τ 3^m 1 — Au^{197}(140-Mev N^{14}) chem
α 6.28 5 — ic
Assignment from α and ε/α systematics

57S100 A.W.Stoner, E.K.Hyde, J. Inorg. Nuclear Chem. 4, 77 (1957).

$Rn^{206}_{86\ 120}$ 6.5^m

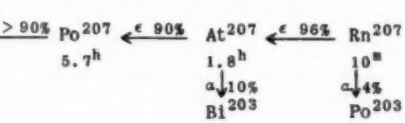
τ 6.5^m 5 — Au^{197}(140-Mev N^{14}) chem
α 6.25 5 — ic
ε 35% (Po^{206} 4% 5.21α)/(Rn^{206} 6.25α)
p 51^m Po^{202} from growth and decay of 5.57α



57S100 A.W.Stoner, E.K.Hyde, J.Inorg. Nuclear Chem. 4, 77 (1957).

$Rn^{207}_{86\ 121}$ 10^m

τ 10^m 2 — Au^{197}(140-Mev N^{14}) chem
α 6.12 5 — ic
ε 96% (At^{207} 10% 5.75α)/(Rn^{207} 6.12α)
p 1.8^h At^{207} from growth and decay of 5.75α



57S100 A.W.Stoner, E.K.Hyde, J.Inorg. Nuclear Chem. 4, 77 (1957).

$Rn^{208}_{86\ 122}$ 23^m

τ 21^m 3 — Au^{197}(140-Mev N^{14}) chem
α 6.14 5 — ic
ε 80% (Po^{208} 5.11α)/(Rn^{208} 6.14α)

57S100 A.W.Stoner, E.K.Hyde, J. Inorg. Nuclear Chem. 4, 77 (1957).

Rn^{218} 86 132 19^{ms}

Th^{226} recoils from U^{230}

α	0.2%*	(6.52)*		scin $\alpha\gamma$
	99.8%*	7.127 *10*		s

$\gamma(Po^{214})$

	0.20†	**0.609** *6*	scin

$(0.652\alpha)(0.609\gamma)$

*From intensity and energy of 0.609γ

†Photons per 100 α's

56A38 F.Asaro, I.Perlman, Phys. Rev. 104, 91 (1956).

Ra^{222} 88 134 38^{s}

$21^{d}U^{230}$ source

$\gamma(Rn^{218})$	**0.3246**	sπ ce

56S88 W.G.Smith, F.Asaro, J.M.Hollander, Phys. Rev. 104, 99 (1956).

$\alpha(0.325\gamma)$ delay $<0.8^{m\mu s}$ U^{230} source

56S123 D.Strominger, UCRL-3374 (1956).

Ra^{222} recoils from Th^{226}; $31^{m}Th^{226}$ source

α	4.4%*	(6.22)		scin $\alpha\gamma$
	~96%	6.551 *10*		s

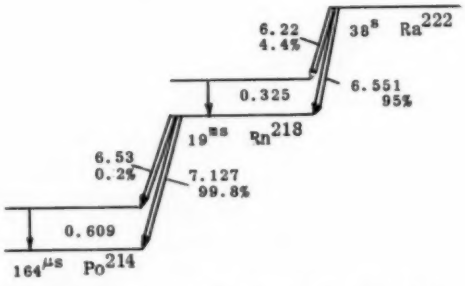
$\gamma(Rn^{218})$

	3.6†	**0.325** *3*	$\alpha_K = 0.08$	scin x/γ

$(\sim 6.22\alpha)(0.325\gamma)$

*From intensity and energy of 0.325γ

†Photons per 100 α's



56A38 F.Asaro, I.Perlman, Phys. Rev. 104, 91 (1956).

Ra^{223} 88 135 12^{d}

ce	40*	**0.018**	45*	**0.067**	ppl
	42*	**0.028**	16*	**0.076**	(α)(ce)
	58*	**0.043**	7*	**0.082**	
	99*	**0.054**	6*	**0.093**	

(α)(0 ce) in 48% ppl

(α)(1 ce) in 49%

(α)(2 ce) in 2.6%

(α)(0.054 ce)(0.067 ce)

(α)(0.028 ce)(0.054 ce)

*Relative ce intensities

55M97 C.Matiassek, Sitzber Akad. Wiss. Wien Abt. 164, 161 (1955).

460722 O-58-9

Ra^{226} 88 138 1620^{y}

τ **1617**^{y} *11* specific activity 3.619×10^{10} *25* α's/sec g Ra

56S110 W.Sebaoun, Ann. Phys. 1, 680 (1956).

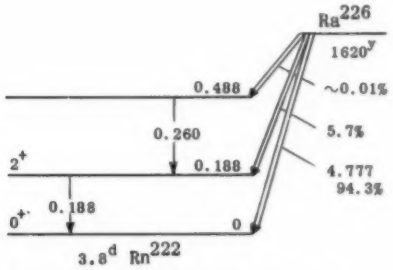
$\gamma(Rn^{222})$ >99.9% pure Ra^{226}

	100†	**(0.188)**	scin
	0.25†	**0.260** *5*	

$(0.260\gamma)(0.188\gamma)$

No 0.448γ (<0.012†) No 0.663γ (<0.01†)

Result indicates that transition to rotational level pattern occurs between Z = 86 and 88*



56H71 G.Harbottle, M.McKeown, G.Scharff-Goldhaber, Phys. Rev. 103, 1776 (1956); *G.Scharff-Goldhaber, Phys. Rev. 103, 837 (1956).

Ra^{227} 88 139

Resonance $Ra^{226}(n)$ E_n = 0.02 to 50 ev (Excitation = 4.4 Mev) chopper

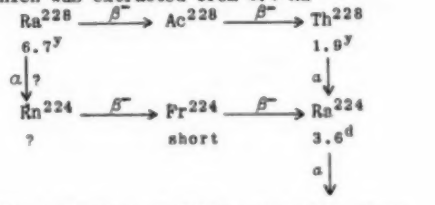
$\sigma_o(10^3 b)$	E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)
3.60 *15*	**0.537** *6*	0.029 *1*	29 *1*

57P16 M.I.Pevzner, L.S.Davelyan, Y.V. Adamchuk, Atom. Energiya 1, No. 4, 67 (1956); J.Nuclear Energy 4, 366 (1957).

Ra^{228} 88 140 6.7^{y}

$\alpha/\beta \leq 2 \times 10^{-8}$[if $\tau(Rn^{224})$ = 6 to 60 min] or $\leq 3 \times 10^{-9}$[if $\tau(Rn^{224})$ = 100 to 200 hr]

From yield of 4-prong stars (Ra^{224} decay) in ppl loaded with Ra precipitated from Rn which was extracted from $6.7^{y}Ra^{228}$



57F46 N.Feather, N.Miller, S.W.Peat, Proc. Phys. Soc. 70A, 478 (1957).

Th^{226} 90 136 31^{m}

$21^{d}U^{230}$ source

$\gamma(Ra^{222})$	**0.1111** *3*	sπ ce

56S88 W.G.Smith, F.Asaro, J.M.Hollander, Phys. Rev. 104, 99 (1956).

Th^{226} 90 136 31^m

Th^{226} recoils from U^{230}

α	0.58%	6.029	19%*	6.220	s
	1.7%	6.095	79%	6.330 *10*	

γ(Ra^{222}) scin

4.8†	0.112 *3*	α = 3.0, $\alpha_K \leq 0.4$
0.4†	0.131 *5*	
0.40†	0.197 *10*	α ~ 0.4
1.2†	0.242 *3*	

(0.112γ)(~0.130, ~0.190γ, not 0.242γ)

*Contribution of Ra^{222} subtracted

†Photons per 100 α's

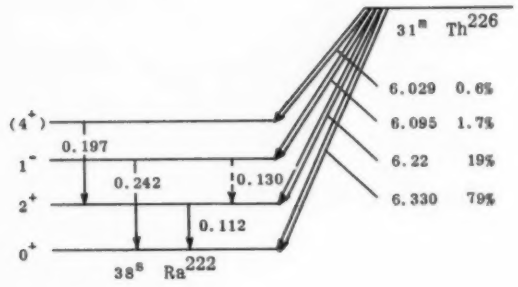
56A38 F.Asaro, I.Perlman, Phys. Rev. 104, 91 (1956).

α(0.112γ) delay < $1.4^{m\mu s}$ U^{230} Source

α(0.197γ) delay < $1.5^{m\mu s}$

α(0.242γ) delay < $1.2^{m\mu s}$

56S123 D.Strominger, UCRL-3374 (1956).



56A38 F.Asaro, I.Perlman, Phys. Rev. 104, 91 (1956).

Th^{227} 90 137 18^d

γ(Ra^{223}) 0.050 scin

0.235 double

α(0.050γ, K x ray) delay < $2^{m\mu s}$

α(0.235γ) delay < $1^{m\mu s}$

56S123 D.Strominger, UCRL-3374 (1956).

Th^{232} 90 142 1.4×10^{10}y

4 samples of Th^{232} in secular equilibrium

τ 1.42×10^{10}y *7*

From absolute intensity of Tl^{208} 2.62γ and Bi^{212} α branching of 36.2 6%

56S117 F.E.Senftle, T.A.Parley, N.Lazar, Phys. Rev. 104, 1629 (1956).

τ 1.39×10^{10}y *3*

specific activity ppl

56P42 E.Picciotto, S.Wilgain, Nuovo Cim. 4, 1525 (1956).

α 4.007 *5* ic

57H08 B.G.Harvey, H.G.Jackson, T.A.Eastwood, G.C.Hanna, Can. J. Phys. 35, 258 (1957).

Th^{232} 90 142

Level $Th^{232}(\alpha,\alpha'\gamma)$ E_α = 3.33; scin

0.050 *5* $\tau = 0.77^{m\mu s}$ *39* (α = 340)

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Level $Th^{232}(\alpha,\alpha'\gamma)$ E_α = 4; scin γ

(0.050) $\tau = 0.40^{m\mu s}$ *6* (α = 333)

Reaction γ's $Th^{232}(p,p'\gamma)$ E_p = 5; scin γ

0.790 level $\tau = 1.8^{\mu\mu s}$ *2* $J = 2^+$

68†	0.740	p,γ(θ)
36†	0.790	

Also observed 0.613γ

57M37 F.K.McGowan, P.H.Stelson, Bull. Am. Phys. Soc. 2, No. 4, 207 P1 (1957); verbal report.

Th^{233} 90 143

Resonances $Th^{232}(n)$ chopper

E_0(ev)	Γ_n°(mev)*	E_0(mev)	Γ_n°(mev)*
22.0 *2*	0.27[a] *8*	195 *4*	1.6 *5*
23.6 *2*	0.69[b] *16*	210 *4*	0.1 *1*
60.0 *7*	0.87 *25*	225 *5*	1.0 *6*
70.7 *9*	5.3 *13*	235 *5*	0.9 *5*
115 *2*	1.4 *5*	260 *6*	0.3 *2*
125 *2*	2.2 *9*	270 *6*	3.7 *8*
135 *2*	1.3 *5*	295 *8*	0.7 *4*
175 *3*	2.6 *9*	350 *9*	~12

**Measured Γ_γ(mev): [a]28 *11*, [b]25 *8*. 25±10 was used for the others

$\frac{D}{\Gamma_n^\circ}$ 20 ev E_n = 22 to 295 ev

Γ_n°/D 1.06×10^{-4} *30*

57R06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J. Nuclear Energy 5, 92 (1957); Atom. Energiya 1, No.5, 55 (1956)

Pa^{228} 91 137 22^h

γ(Th^{228}) Th^{232}(50-Mev p,5n) chem

5200*		0.0575	L_2/L_3 = 1 scin,sd ce
	100†	0.0777	
		0.0966	
1080*		0.1286	
		0.156	
290*	4†	0.1845	K/L_1 = 6.0 *10*
	18†	0.2240	
132*		0.2832	K/L_1 = 3.2 *6*
60*	10†	0.3285	K/L_1 = 1.4
		0.3370	
75*	8†	0.4110	K/L_1 = 1.6 *5*
46*		0.4454	K/L_1 = 7 *2*
150*	20†	0.4656	K/L_1 = 2.2 *5*
		0.793	
62*		0.914	K/L_1 = 4 *1*
64*	40†	0.968	K/L_1 = 3.5 *10*
		1.095	
	6†	1.572	

No 0.113, 1.035, 1.640γ sd ce

Unassigned ce: 0.624, 0.648, 1.230

*Relative ce intensities

56O11 Ong Ping Hok, E.Arbman, Arkiv Fysik 11, 193 (1956).

Pa^{230} 91 139 18^d

$\gamma(U^{230})$ **0.0517** *1* sπ ce

56H63 Hill, P.Asaro, F.S.Stephens, Jr., J.M.Hollander, quoted by J.M.Hollander, Phys. Rev. 103, 1590 (1956).

Pa^{231} 91 140 $3.4\times10^4{}^y$

$\alpha(0.300\gamma)$ delay $<1.5^{m\mu s}$ scin

56S123 D.Strominger, UCRL-3374 (1956).

Pa^{233} 91 142 27^d

τ **26.95**^{d} *6* $22^m Th^{233}$ source chem

Decay followed for 2 half-lives ic,scin γ

57W37 H.W.Wright, E.I.Wyatt, S.A.Reynolds, W.S.Lyon, T.H.Handley, Nuclear Sci. Eng. 2, 427 (1957).

τ **27.0**^{d} *1*

56M60 L.D.McIsaac, E.C.Freiling, Nucleonics 14, No. 10, 65 (1956).

U^{230} 92 138 21^d

Th^{232}(100-Mev p,3nβ) chem

α	0.7%	**5.658**	(2 unresolved α's)	s
	32.1%	**5.813**		
	67.2%	**5.884** *5*		

$\gamma(Th^{226})$ scin

0.75†	**0.072** *2*	α=42
0.33†	**0.158** *3*	
0.24†	**0.232** *3*	

†Photons per 100 α's

56A38 F.Asaro, I.Perlman, Phys. Rev. 104, 91 (1956).

Th^{232}(100-Mev p,3nβ) chem

$\gamma(Th^{226})$ **0.07213** *7* sπ ce

0.1543 *3*

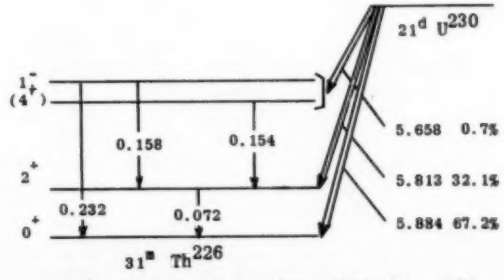
56S88 W.G.Smith, F.Asaro, J.M.Hollander, Phys. Rev. 104, 99 (1956).

Th^{232}(p,3nβ) chem

$\alpha(0.072, 0.158\gamma)$ delay $<1.5^{m\mu s}$ scin

$\alpha(0.232\gamma)$ delay $<1.2^{m\mu s}$

56S123 D.Strominger, UCRL-3374 (1956).



56A38 F.Asaro, I.Perlman, Phys. Rev. 104, 91 (1956).

U^{233} 92 141 $1.6\times10^5{}^y$

α's emitted preferentially in the direction perpendicular to nuclear axis $\alpha(\theta,T)$

$W(\theta,T) = 1 + (A_2/T)P_2(\cos\theta)$ $A_2 = -0.063$ *2*

57D01 J.W.T.Dabbs, L.D.Roberts, G.W.Parker, Bull. Am. Phys. Soc. 2, No. 1, 31 (1957).

U^{233} 92 141

Ground state

J **5/2** s

$\mu(U^{233})/\mu(U^{235}) = -1.6$ *1*

$q(U^{233})/q(U^{235}) = +0.8$ *3*

56K53 N.I.Kaliteevskii, M.P.Chaika, Optika Spektroskopiya 1, 809 (1956); AEC-tr-2890; This paper supersedes Doklady Akad. Nauk SSSR 103, 49 (1955).

Ground state

J **5/2** para

$|\mu|$ **0.54*** or **0.48**$^\$$

$|\mu(U^{235})|/|\mu(U^{233})| = 0.651$* *2* or 0.663 *12*$^\$$

$|q|$ **3.5*** or **3.3**$^\$$

$|q(U^{235})|/|q(U^{233})| = 1.17$ *20*

*Calculated from |A|, g_u

$^\$$Calculated from |B|, g_l

U^{235} data from previous work**

57D40 P.B.Dorain, C.A.Hutchison,Jr., E.Wong, Phys. Rev. 105, 1307 (1957); **Hutchison et al, Phys. Rev. 102, 292 (1956); Bleaney et al, Proc. Phys. Soc. 69, 1167 (1956).

Ground state

J **5/2** S

q **+13** *5*

56Z05 A.G.Zimin, N.M.Iashin, Doklady Akad. Nauk SSSR 109, 283 (1956); Soviet Phys. Doklady 1, 419 (1956).

Reaction γ's $U^{233}(\alpha,\alpha'\gamma)$ $E_\alpha = 3$ pc

100	†	**0.0405** *2*
10	2†	**0.0523** *6*
64	9†	**0.0921** *10*

56N24 J.O.Newton, Nuovo Cim. Suppl. 4, 1156 (1956).

U^{234} 92 142 $2.5\times10^5{}^y$

α **4.768** *3* ic

57H08 B.G.Harvey, R.G.Jackson, T.A.Eastwood, G.C.Hanna, Can. J. Phys. 35, 258 (1957).

U^{234} 92 142

Resonance peaks $U^{233}(n)$ (Excitation = 6.8 Mev) $E_n = 0.0015$ to 11ev chopper, cryst

1.78*ev	**4.8***
2.27	**6.7**
3.7*	**11**

*Breit-Wigner single level fit not possible

56P31 N.J.Pattenden, J.Nuclear Energy 3, 28 (1956).

U^{234} 92 142

Resonances $U^{233}(n,f)$ E_n = 1 to 15 ev chopper (Excitation = 6.8 Mev)

1.78 ev	7.6
2.3	8.63
3.6	9.3
4.45	10.45
4.73	11.44
5.0	12.1
5.9	12.78
6.85	13.6

$\bar{\Gamma}_f$ 165 mev

D 0.75 ev

57M61 L.G.Miller, R.G.Fluharty, R.M.Brugger, M.S.Moore, Bull. Am. Phys. Soc. 2, No. 1, 70 XA10 (1957).

Resonances $U^{233}(n,f)$ cryst

E_o(ev)	$g\Gamma_n$(mev)	Γ_f(mev)	Γ_γ(mev)
(-5.0)*	7.15	360	41
(0.10)*	0.00053	1000	40
1.785	0.20	254	45
2.30	0.092	62	40
3.63	0.074	157	40
(4.5)*	0.032	180	40
(4.7)*	0.022	130	40

*E_o and Γ's needed to fit other resonances

56M74 M.S.Moore, L.G.Miller, C.W.Reich, Bull. Am. Phys. Soc. 1, No. 7, 327 G10 (1956).

U^{235} 92 143 7.1×10^{8}y s.s.

τ 7.53×10^{8}y 22 specific activity

747 ±22 α's/sec mg U^{235}

56K39 G.B.Knight, K-663 (1950); declassified Feb. 1956. Nuclear Sci. Abstr. 10, 7360 (1956).

τ 6.84×10^{8}y* 15

α 4.175 44 scin αγ

4.390 15

γ(Th^{231})

137 22† 0.177 23 scin αγ

10 † 0.367 31

(E_γ > 0.067)(4.39α) (E_γ > 0.30)(4.175α)

(E_α > 0.45)(0.177, 0.367γ)

*From measured relative intensities in U : ($U^{238}\alpha$ + U^{235} 4.2α) : (U^{235} 4.4α) : (U^{234} + U^{235} 4.6α) = 95115 *310* : 3880 *66* : 95491 *310* . Assumed 85.6% for 4.4α, 4.2% for 4.2α of U^{235}

57W39 E.Würger, K.P.Meyer, P.Huber, Helv. Phys. Acta 30, 157 (1957).

>99% U^{235}

γ(Th^{231}) 0.109 scin

0.143

0.184

α(0.184γ) delay < $1.5^{m\mu s}$

56S123 D.Strominger, UCRL-3374 (1956).

U^{235} 92 143 27^{m}

source: U^{235} recoils from Pu^{239}

τ 26.5^{m} 2

ce ≤0.001 a pc

ce/(Pu^{239} α) ~0.2 (low due to absorption)

2.5 μg/cm^2 reduced count by factor of > 100

Authors suggest $1/2^+$ to $7/2^-$ transition

57A62 F.Asaro, I.Perlman, Phys. Rev. 107, 318 (1957).

τ 26.6^{m} 3 extracted from Pu^{239}

ce ≤0.002 a pc

ce/(Pu^{239} α) ~0.1 (low due to absorption)

Authors suggest $1/2^+$ to $7/2^-$ transition

57H78 J.R.Huizenga, C.L.Rao, D.W.Engelkemeir, Phys. Rev. 107, 319 (1957); Bull. Am. Phys. Soc. 2, No. 4, 198 K13 (1957).

U^{235} 92 143

Ground state

J 7/2 S

$\mu(U^{233})/\mu(U^{235})$ = -1.6 *1*

$q(U^{233})/q(U^{235})$ = +0.8 *3*

56K53 N.I.Kaliteevskii, M.P.Chaika, Optika Spektroskopiya 1, 809 (1956); AEC-tr-2890; This paper supersedes Doklady Akad. Nauk SSSR 103, 49 (1955).

Ground state enriched U^{235}

q (-?) 3.8 para

56B129 B.Bleaney, C.A.Hutchison, P.M. Llewellyn, D.F.D.Pope, Proc. Phys. Soc. 69B, 1167 (1956).

Reaction γ's $U^{235}(\alpha,\alpha'\gamma)$ E_α = 1.7 to 3.0 pc

0.046 level B(E2) = 7.4 *14*

0.04623 *20*

0.103 level B(E2) = 1.18 *28*

0.04623 *20*

66† 0.0567*4 *30*

16† 0.1032 *10*

†Photons/(10^3 0.046 photons) at E_α = 2.85

*Assigned to 0.103 level from excitation function

57N07 J.O.Newton, Nuclear Phys. 3, 345 (1957); Nuovo Cim. Suppl. 4, 1156(1956).

U^{236} 92 144

Resonances $U^{235}(n)$ E_n = 0.1 to 10 ev (Excitation = 6.4 Mev) cryst

E_o(ev)	Γ(mev)	Γ_γ(mev)	Γ_f(mev)
0.282	99.7	27.9	71.8
1.138	134	41.9	92.1
2.036	43	36	7
4.847	28	25.6	2.4

Capture σ can be fitted with single level formula but fission σ with asymmetrical peaks cannot

57S47 F.J.Shore, V.L.Sailor, Bull. Am. Phys. Soc. 2, No. 1, 70 XA12 (1957); verbal report.

U^{236} 92 144

Resonances $U^{235}(n)$ E_n = 1.5 to 60ev (Excitation = 6.4 Mev) fast chopper

Γ(mev)	E_o(ev)	Γ_n[$](mev)	Γ_f(mev)
138 5	0.290 5	0.0037 1	98* 7
142 7	1.13 1	0.0146 6	107* 10
43 5	2.04 3	0.0066 3	12* 3
	2.82 5	0.0026 7	
150 40	3.14 2	0.028 2	115 44
80 20	3.61 2	0.053 3	45 24
46 20	4.84 2	0.054 5	4* 2.5
	5.45 10	0.022 4	
	5.83 10	0.016 3	
	6.12 10	0.027 4	
53 10	6.40 5	0.30 3	18 14
56 15	7.10 5	0.11 2	21 19
95 15	8.82 7	1.3 1	59 19
	9.3 1	0.11 2	
	9.8 1	0.025 4	
	10.2 1	0.065 8	
	10.6 1	0.033 7	
	11.1 1	0.045 7	
42 15	11.7 1	0.79 8	6 19
61 15	12.4 1	1.4 1	25 19
	13.4 1	0.08 2	
	13.8 1	0.15 3	
	14.1 1	0.20 3	
	14.6 2	0.17 2	
	15.5 2	0.27 3	
	16.1 2	0.29 4	
	16.8 2	0.29 4	
	18.1 2	0.46 7	
	18.7 2	0.20 6	
120 20	19.3 2	3.2 3	82 24
	20.6 2	0.36 11	
	21.1 2	0.9 3	
	22.1 3	0.09 2	
	22.9 3	0.65 8	
	23.5 3	1.8 2	

E_o(ev)	Γ_n[$](mev)	E_o(ev)	Γ_n[$](mev)
24.4 3	0.44 6	30.7 4	0.44 7
25.3 3	0.38 7	31.1 4	0.45 8
25.8 3	0.31 6	32.1 4	1.2 2
26.5 3	0.49 9	33.6 4	2.2 4
27.3 3	0.11 4	34.6 5	4.5 9
27.9 3	0.78 11	35.3 5	7.7 15

[$]Used $\overline{\Gamma}$ = 100 ±20 mev when Γ was not determined
*Used "world's best" σ_f curve; remaining Γ_f's obtained using Γ_γ = 35 ±4 mev

56P33 V.E.Pilcher, J.A.Harvey, D.J.Hughes, Phys. Rev. 103, 1342 (1956).

Resonances $U^{(235)}(n,f)$ pulsed n's

E_o(ev)	$\sigma_f\Gamma$(ev-b)
8.8	113 10
11.7	11.8 3
12.3	50 5
19.3	111 10

56Y03 M.L.Yeater, W.R.Mills, E.R.Gaerttner, Phys. Rev. 104, 479 (1956).

U^{237} 92 145 6.75[d]

τ 6.8[d] U^{236}(pile n,γ) chem

β^- ~4% (≤0.18) from γ intensities
96% 0.248 sd

No 0.45β (< 1%)

$\gamma(Np^{237})$ scin, s77 ce, sd ce

			α_K	α_{L1}	α_{L2}	α_{L3}
15%		0.02635[a]				
15%		0.03320				
7%		0.04346				
81%	38†	0.05957		0.21	0.41	0.13
3%	38†	0.0648		0.1	0.1	0.1
not in decay scheme		0.1139				
7%	3.6†	0.1646	~0.13	0.04	0.35	0.16
89%	24†	0.2079[b]	2.3		0.06	0.003
~0.2%		0.2342				
1.7%	0.86†	0.2675[c]	0.63	0.19		
1.5%	1.57†	0.3323	0.038		0.025	
~0.2%	1.57†	0.3353	0.2			
~0.05%	0.10†	0.3685	>0.24			
~0.10%	0.10†	0.3709	>0.44			
	55†	K x ray				

Error in E_γ = 0.2%

[a]$N_1:N_2:N_3$ = 17:33:10
[b]E2/M1 = 0.005 5 from α_{L3}
[c]M2/E1 = 0.16 from α_K and α_{L1}

α's determined from 0.2079γ α_K = 2.3 (measured by x/γ), relative ce and γ intensities, and if 0.2079γ K/L_1 = 5.16 (Rose theoretical value)

Unassigned ce's: 0.00999, 0.02267, 0.1396, 0.2005, 0.2285

(L x ray)(K x ray, 0.165, 0.208, 0.332γ)
(0.06γ)(K x ray, 0.165, 0.208, 0.267γ)
(L x ray)(< 20% of 0.37γ's)

No (0.06γ)(0.33, 0.37γ's)
[(0.165γ)(0.208γ)]/[(0.06γ)(0.208γ)] < 0.001
[(~0.06γ)(0.208γ)]/[(~0.06γ)(0.267γ)] = 17
[(L x ray)(0.208γ)]/[(L x ray)(~0.33γ)] = 7
0.0764 and 0.1585 levels of Np^{237} are not populated in the decay of U^{237}

57R04 J.O.Rasmussen, F.L.Canavan, J.M. Hollander, Phys. Rev. 107, 141 (1957).

$\gamma(Np^{237})$ $U^{(238)}$(n,2n) chem

		s77 ce
0.0263		
0.0332	0.2341	
0.0434	0.2673	
0.0596	0.3321	
0.0648	0.3352	
0.1643	0.3684	
0.2077	0.3707	

(0.25β)(ce 0.207γ) delay = 5.4[mμs] 5 scin
All γ's fitted into levels at 0.0332, 0.0596, 0.1030, 0.2673, 0.3321, 0.3684, 0.3707

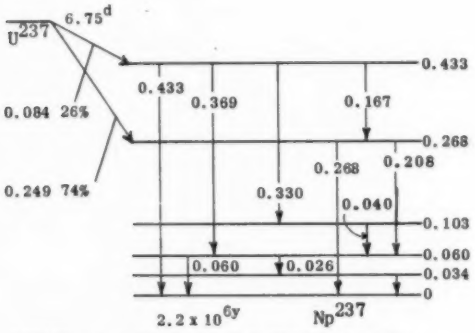
57B142 M.E.Bunker, J.P.Mize, J.W.Starner, Bull. Am. Phys. Soc. 2, No. 2, 104 J2 (1957); priv. comm.

U^{237} 92 145 6.75^d

β^- 26% **0.084** *5* $U^{236}(n,\gamma)$ chem; sd
74% **0.249** *5*

$\gamma(Np^{237})$ **0.0264** (e_A?) sd ce
19* **0.0333** (e_A?)
43* **0.0435** $L_1/L_{23} = 1.7$
272* **0.0597** $L_1:L_2:L_3 = 170:28:52$
21* **0.1654** $K:L_2:M_1 = 110:66:35$
536* **0.2082** $K:L_1:MN = 350:90:28$
vw **0.2675** vw **0.3695**
vw **0.3315** vw ~**0.436**

Also possible: vw 0.069, 0.10, 0.12, 0.19 γ's
No β with $E_\beta > 0.26$
*ce per 1000 0.249 β's



56B139 S.A.Baranov, K.N.Shliagin, Zhur. Eksptl' i Teoret. Fiz. 30, 225 (1956); JETP 3, 200 (1956).

U^{238} 92 146 4.5x10^{9y}

τ **4.56 x 10^{9y}** *3*
specific α activity

57L21 R.B.Leachman, H.W.Schmitt, J. Nuclear Energy 4, 38 (1957).

α **4.195** *5* ic

57H08 B.G.Harvey, H.G.Jackson, T.A.Eastwood, G.C.Hanna, Can. J. Phys. 35, 258 (1957).

U^{238} 92 146

Level $U^{238}(\alpha,\alpha'\gamma)$ $E_\alpha = 2.85$; pc
0.0447 *2* $\tau = 0.23^{m\mu s}$ *6* (α = 650)

57N07 J.O.Newton, Nuclear Phys. 3, 345 (1957); Nuovo Cim. Suppl. 4, 1156(1956).

Level $U^{(238)}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.33$; scin
0.045 *3* $\tau = 0.44^{m\mu s}$ *22* (α = 700)

56D40 R.H.Davis, A.S.Divatia, D.A.Lind, R.D.Moffat, Phys. Rev. 103, 1801 (1956); 100, 1266A (1955).

Levels $U^{238}(n,n')$ $E_n = 0.15, 0.25, 0.50$

$\sigma(0.15)$*	Level	$\sigma(0.25)$*	$\sigma(0.50)$*
0.44 *20*	**0.050** *20*	0.19 *10*	0.18 *10*
	0.140 *25*	0.29 *15*	0.49 *25*

From pulse-height distributions of proton recoils with and without a U^{238} shell around detector
*Inelastic σ in barns for indicated E_n

57A34 R.C.Allen, Phys. Rev. 105, 1796 (1957).

U^{239} 92 147

Resonances $U^{238}(n)$ E_n = 5 to 300 ev
(Excitation = 4.7 Mev) chopper

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)
20.5 *37*	**6.67**	0.56 *5*	26.0 *30*
0.015	**10.2**	0.00044*	(24)
39.0 *33*	**20.8**	2.16 *9*	21.9 *23*
38.0 *70*	**36.6**	5.6 *4*	29 *10*
19.0 *40*	**66.0**	2.8 *2*	25.6 *90*

9 additional resonances from 80 to 237 ev
*Small value indicates p-wave resonance

$\overline{D}$ **18** *4* ev E_n = 0 to 189 ev
$\overline{\Gamma_n^o}/D$ **1.43 x 10^{-4}** *40* E_n = 0 to 255 ev
$\overline{\Gamma_\gamma}$ **23.8** *16* mev

57B109 L.M.Bollinger, R.E.Cote', D.A. Dahlberg, G.E.Thomas, Phys. Rev. 105, 661 (1957).

Resonances $U^{(238)}(n)$ chopper
(Excitation = 4.7 Mev)

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)
20.0 *18*	**6.69** *2.5*	0.445 *15*	21.2 *13*
17.0 *25*	**21.0** *1*	1.38 *13*	36.0 *35*
25.0 *80*	**37.0** *4*	3.6 *6*	34 *10*
14 *10*	**67.7** *8*	2.3 *5*	26 *12*
	83.0 *11*	0.3 *1*	21 *15*

E_o(ev)	Γ_n^o(mev)*	E_o(ev)	Γ_n^o(mev)*
89.5 *12*	0.01 *1*	**194** *4*	7.4 *7*
105 *1*	5.0 *5*	**202** *4*	5.3 *5*
120 *2*	3.7 *2*	**240** *5*	4.5 *13*
135 *2*	0.20 *16*	**254** *6*	1.2 *7*
142 *2*	0.04 *3*	**272** *7*	3.3 *4*
146 *2*	0.33 *26*	**291** *8*	3.8 *10*
165 *3*	~0.07	**355** *10*	7.5 *47*
*If Γ_o(mev) = 30 *8*		**405** *12* 13	4

$\overline{D}$ **17** ev E_n < 300 ev
$\overline{\Gamma_n^o}/D$ **1.5 x 10^{-4}** *2*

57H06 I.A.Radkevich, V.V.Vladimirsky, V.V. Sokolovsky, J.Nuclear Energy 5, 92 (1957); Atom. Energiya 1, No. 5, 55 (1956).

Resonances $U^{(238)}(n)$ E_n = 10 to 300 ev
(Excitation = 4.7 Mev) chopper

$\sigma_o(10^3 b)$	E_o(ev)	Γ_n^o(mev)	Γ_γ(mev)
35 *13*	**21.2** *3*	2.2 *4*	26 *12*
38 *18*	**37.0** *6*	5.4 *16*	28 *24*
16 *7*	**66.0** *25*	3.1 *10*	39 *26*
19 *11*	**101.0** *30*	6.8 *20*	24 *26*

4 additional resonances from 80 to 200 ev
$\overline{\Gamma_n^o}$ **2.8** *9* mev for E_n = 6 to 200 ev
$\overline{D}$ **18** *2* ev
$\overline{\Gamma_n^o}/D$ **1.55 x 10^{-4}** *50*
$\overline{\Gamma_\gamma}$ **29.3** *10* mev

56F28 R.G.Fluharty, F.B.Simpson, O.D.Simpson, Phys. Rev. 103, 1778 (1956); priv. comm.

U^{239} 92 147

Resonances $U^{(238)}(n,\gamma)$ E_n = 0.003 to 0.2 (Excitation = 4.7 to 4.9 Mev)

$\langle\Gamma_\gamma/D\rangle$ 1.2×10^{-3} for $l_n = 0$ and 3.6×10^{-3} for $l_n = 1$

$\langle\Gamma_n^\circ/D\rangle$ 1.4×10^{-4} for $l_n = 0$ and 0.7×10^{-4} for $l_n = 1$

57N06 H.W.Newson, E.G.Bilpuch, Bull. Am. Phys. Soc. 2, No. 4, 218 S7 (1957).

U^{239}? 92 147

Reaction γ's U^{238}(pile n, ?)

σ	E_γ	
1.3 *3*	**4.0** *1*	scin pr
0.20 *7*	**5.9** *1*	
0.10	**7.5** *2*	

56K34 R.W.Kenney, J.T.Mattingly, Bull. Am. Phys. Soc. 1, No. 8, 389 M4 (1956).

Np^{236} 93 143 22^h

$\gamma(U^{236})$	**0.04528** *6*	sπ ce
$\gamma(Pu^{236})$	**0.04463** *10*	

56A40 R.G.Albridge, J.M.Hollander, quoted by J.M.Hollander, Phys. Rev. 103, 1590 (1956).

Np^{237} 93 144 2.2×10^{6y}

$\gamma(Pa^{233})$	**0.030**	scin $\alpha\gamma$
	0.087	
	0.140	
	0.200	

α(0.030, 0.087γ) delay = $37^{m}\mu s$

α(0.140, 0.200γ) delay < $2^{m}\mu s$

55S88 D.Strominger, J.O.Rasmussen, Phys. Rev. 100, 844 (1955).

Np^{237} 93 144

Reaction γ's $Np^{237}(\alpha,\alpha'\gamma)$ E_α = 3

100 †	**0.0335** *2*	pc
45 *5*†	**0.0429**	
~5 †	**(0.076)**	

56N24 J.O.Newton, Nuovo Cim. Suppl. 4, 1156 (1956).

Np^{238} 93 145 2.1^d

β^- 8% ~0.200? Np(pile n,γ) chem; sd

31% **0.250** *10*

20% **0.280** *10*

2.8%* **(1.133)**

38% **1.236** *5*

$\gamma(Pu^{238})$

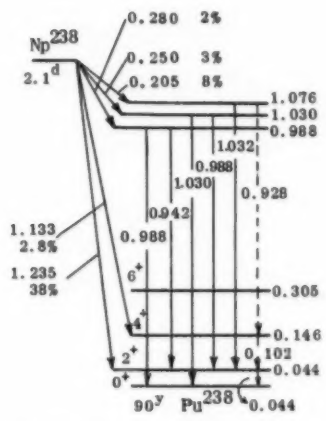
	α	L_2: L_3: M_2: M_3	
0.044	large	250: 228: 125: 62	
0.102	large	131: 69: 43: 38	
0.942			
0.988	$K/L_2 = 3.2$		sd ce
1.030			scin
1.032			

*From (>0.50β)(ce 0.044, 0.102γ) scin

Continued

Np^{238} 93 145 2.1^d

Continued



56B95 S.A.Baranov, K.N.Shlyagin, J.Nuclear Energy 3, 132 (1956); Soviet J. Atomic Energy No. 1, 51 (1956).

Np^{238} 93 145

Resonances $Np^{237}(n)$ E_n = 0.02 to 2.8 ev (Excitation = 5.5 Mev) cryst

σ_o	E_o(ev)	
2600 *100*	**0.489** *2*	Γ = 32 *3* mev
		$g\Gamma_n^\circ$ = 0.021 mev
	1.337 *15*	$\sigma_o\Gamma \sim 29$ ev-b
	1.488 *18*	$\sigma_o\Gamma \sim 140$ ev-b
$\frac{D}{\Gamma_n^\circ/D}$	**1.0** ev	
	$\sim 0.7 \times 10^{-4}$	

57S79 M.S.Smith, R.R.Smith, E.G.Joki, J.E. Evans, Phys. Rev. 107, 525 (1957); 99, 611A (1955).

Np^{239} 93 146 2.3^d

				$U^{238}(n,\gamma\beta)$	chem
β	22%	**0.070?** *5*	16%	**0.439** *5*	sd
	35%	**0.327** *5*	~2%	**0.655?**	
	21%	**0.382** *5*	4%	**0.723** *5*	

$\gamma(Pu^{239})$		**0.012?**		sd ce
	w	**0.0444**	$L_1/L_2 = L_1/L_3 \sim 1.5$	M1 + E2
	w	**0.0493**	$L_2/L_3 \sim 1.0$	E2/M1 = 4
	w	**0.0572**	$L_2/L_3 \sim 1.0$	E2
	w	**0.0614**		E1?
	st	**0.0679**	$L_2/L_3 \sim 1.0$	E2
	st	**0.1062**		E1?
	st	**0.2103**	K/L ~ 6	M1
	st	**0.2284**	K/L ~ 4.8	M1
		0.2781	K/L ~ 4.7	M1
		0.334		M1

(0.106γ)(>0.200γ's) scin

Decay scheme proposed

56B95 S.A.Baranov, K.N.Shlyagin, J. Nuclear Energy 3, 132 (1956); Soviet J. Atomic Energy No. 1, 51 (1956).

$\gamma(Pu^{239})$	**0.2092**	$\alpha_K = 1.76$ *15*	cryst,
	0.2282	$\alpha_K = 1.60$ *8*	sl ce
	0.2778	$\alpha_K = 1.16$ *6*	

56E13 G.T.Ewan, J.W.Knowles, D.R.Mackenzie, Bull. Am. Phys. Soc. 1, No. 7 330 J8 (1956); verbal report.

Np^{239} 93 146

2.3^d ground state — $U^{(238)}(n,\gamma\beta)$ chem

J 1/2 para

$|\mu(Np^{237})|/|\mu(Np^{239})| = 16.45\ 17$

57A07 M.Abraham, C.D.Jeffries, R.W.Kedzie, J.C.Wallmann, Phys. Rev. 106, 1357 (1957).

Pu^{233} 94 139

20^m

τ 20^m 2 — U^{233}(46-Mev α,4n) chem

α 6.30 2 ic

$\alpha/\epsilon = 0.0012\ 5$ (from yield of $35^m Np^{233}$)

57T10 T.D.Thomas, R.Vandenbosch, R.A.Glass, G.T.Seaborg, Phys. Rev. 106, 1228 (1957).

Pu^{235} 94 141

26^m

τ 26^m 2 — U^{233}(46-Mev α,2n) chem

α 5.85 2 ic

$\alpha/\epsilon = 3.0 \times 10^{-5}\ 6$ x/α

No α's with $E_\alpha > 5.85$

57T10 T.D.Thomas, R.Vandenbosch, R.A.Glass, G.T.Seaborg, Phys. Rev. 106, 1228 (1957).

Pu^{236} 94 142

2.8^y

U^{235}(11.5-Mev d,nβ) chem

τ 2.851^y 8

α 5.75 ic

Sample followed for 3 years

57H66 D.C.Hoffman, G.P.Ford, F.O.Lawrence, J. Inorg. Nuclear Chem. 4, 143 (1957).

Pu^{237} 94 143

46^d

τ 44^d 2 — U^{235}(46-Mev α,2n) chem

α 26 3† 5.36 2 ic

7.1 15† 5.65 2

$\epsilon_L/\epsilon_K = 1.2^*$

†α's per 10^6 disintegrations

57T10 T.D.Thomas, R.Vandenbosch, R.A.Glass, G.T.Seaborg, Phys. Rev. 106, 1228 (1957).
*M.I.Kalkstein, ibid.

τ 45.63^d 20 — U^{235}(26-Mev α,2n) chem

α $\leq$2† ~5.2 ic

10† 5.34 1

$(5.34\alpha)/\epsilon = 2.0 \times 10^{-5}\ 4$ $(5.34\alpha)/(Np^{237}\ \alpha)$

57H68 D.C.Hoffman, J. Inorg. Nuclear Chem. 4, 383 (1957).

Pu^{238} 94 144

90^y

$\gamma(U^{234})$ — d Cm^{242} chem

38 4†	0.04349 8	pc in magnetic field
10 2†	0.0998 4	
1.1 2†	0.1531 6	
x	L x ray	

No K x ray ($<$1.2†)

†Photons per 10^5 α's. Compared 0.043γ intensity and α-decay rate to those of Am^{241} using $0.060\gamma/\alpha = 0.40 \pm 0.025$.

56N17 J.O.Newton, B.Rose, J.Milsted, Phil. Mag. 1, 981 (1956).

Pu^{238} 94 144

90^y

$\gamma(U^{234})$ 0.04350 4 sπ ce

56S92 W.G.Smith, J.M.Hollander, quoted by J.M.Hollander, Phys. Rev. 103, 1590 (1956).

Pu^{239} 94 145

2.4 x 10^{4y}

$\gamma(U^{235})$ — $U^{(238)}(n,\gamma\beta)$ chem

0.003?	
0.0125	sπ GM ce
0.0383	
0.0508	
0.117?	possible ce_L observed

Intense 0.002-Mev ce observed and ascribed to ce_{N+O} 0.003γ, ce_K 0.117γ, or e_A

56S120 K.N.Shliagin, Zhur. Eksptl. i Teoret. Fiz. 30, 817 (1956); Soviet Phys. JETP 3, 663 (1956).

Pu^{239} 94 145

Reaction γ's — $Pu^{239}(\alpha,\alpha'\gamma)$ $E_\alpha = 1.7$ to 3.0

0.057 level B(E2) = 5.3*8 pc

100 † 0.0496 3

163 12† 0.0575 3

*If both γ's originate from 0.057 level as suggested by excitation function

†Relative photon intensities for $E_\alpha = 2.85$

57N07 J.O.Newton, Nuclear Phys. 3, 345 (1957); Nuovo Cim. Suppl. 4, 1156(1956).

Pu^{240} 94 146

6580^y

α	0.003 1%	4.851 5	sd
	0.003 1%	4.924?8	
	0.003 2%	4.952?8	
	0.091 6%	5.014 2	

57K30 L.N.Kondrat'ev, G.I.Novikov, I.P.Sobolev, L.L.Gol'din, Zhur. Eksptl'. i Teoret. Fiz. 31, 771 (1955); Soviet Phys. JETP 4, 645 (1957).

$\gamma(U^{236})$ — $Pu^{239}(n,\gamma)$ chem

0.0446 sπ ce

56S120 K.N.Shliagin, Zhur. Eksptl. i Teoret. Fiz. 30, 817 (1956); Soviet Phys. JETP 3, 663 (1956).

Pu^{241} 94 147

13^y

$Pu^{240}(n,\gamma)$ chem

β^- 0.0208 2 F-K linear sπ

56S120 K.N.Shliagin, Zhur. Eksptl.' i Teoret. Fiz. 30, 817 (1956); Soviet Phys. JETP 3, 663 (1956).

Pu^{241} 94 147

Resonance — $Pu^{240}(n,f)$ cryst

(1.06 ev) $\sigma_0 = 30$

56L19 B.R.Leonard,Jr., E.J.Seppi, W.J.Friesen, E.M.Kinderman, Bull. Am. Phys. Soc. 1, No. 5, 248 C13 (1956).

$Pu^{241}_{94\ 147}$

Resonances Pu^{240}(n) E_n = 0.5 to 5000 ev
(Excitation = 5.5 Mev) chopper

E_n(ev)	Γ_n^o(mev)	E_c(ev)	Γ_n^o(mev)
1.06	2.00 *10*	**89.6**	1.8 *6*
20.4	0.54 *6*	**91.6**	0.4 *2*
38.2	2.25 *23*	**104**	6.1 *25*
41.7	0.29 *7*	**116**	2.0 *20*
66.2	5.5 *22*	**119**	4.3 *26*
72.3	3.4 *14*	Γ_γ = 30 mev used	

$\overline{\Gamma}_n$ **28** *7* mev E_n = 0 to 120 ev
D **12** *2* ev
$\overline{\Gamma}_n^o/D$ **2.0×10^{-4}** *6*

57S59 O.D.Simpson, R.G.Fluharty, Bull. Am. Phys. Soc. 2, No. 4, 219 S12 (1957); verbal report.

$Am^{239}_{95\ 144}$ 12^h

γ(Pu^{239}) Pu^{239}(20-Mev d,2n) chem

				sπ ce
$\leq 32^*$	**0.04470**			
$\sim 35^*$	**0.04947**	71^*	**0.2099**	
128^*	**0.05731**	59^*	**0.2265**	
70^*	**0.06791**	199^*	**0.2283**	
23^*	**0.1818**	140^*	**0.2776**	

No 0.0614, 0.1061γ (<2%)
*Relative ce intensities

57S77 W.G.Smith, W.M.Gibson, J.M.Hollander, Phys. Rev. 105, 1514 (1957).

$Am^{240}_{95\ 145}$ 47^h

γ(Pu^{240}) Pu^{239}(20-Mev d,n) chem

0.04287 *3*	sπ ce
0.09890 *20*	

57S77 W.G.Smith, W.M.Gibson, J.M.Hollander, Phys. Rev. 105, 1514 (1957).

$Am^{241}_{95\ 146}$ 458^y

τ **458.1^y** *5* extracted from $13^y Pu^{241}$ specific activity

57H10 G.R.Hall, T.L.Markin, J.Inorg. Nuclear Chem. 4, 137 (1957).

γ(Np^{237})

25 *2*†	**(0.0264)**	$\alpha_L \sim 6$	scin γ/α
0.73 *7*†	**(0.0434)**	$\alpha_L \sim 180$	γ(0.0596γ)
359†	**(0.0596)**		scin γ/α
0.23†	**(0.099)**		(5.386α)γ
0.19†	**(0.103)**		(5.439α)γ
x 8†	**L_1 x ray**		pc, scin γ/α
135†	**L_α x ray**		
184†	**L_β x ray**	50†	**L_γ x ray**
<0.01†	**K x ray**		

†Photons per 1000 α's
(5.386, 5.439, 5.482α)(0.0596γ)
α(0.0596γ) delay = $69^{m\mu s}$ *2
No γ with E_γ > 0.003 in prompt coincidence with 0.0596γ
0.064 L x rays per α preceed 0.0596γ xγ
0.40 *6* of the 0.033γ converted in the L shell with emission of L x rays
No (0.128γ)(0.0596γ)

57M17 L.B.Magnusson, Phys. Rev. 107, 161 (1957); *D.W.Engelkemeir, ibid; Bull. Am. Phys. Soc. 1, No. 4, 171 E8 (1956).

$Am^{241}_{95\ 146}$ 458^y

Am^{241} in HCl, $HClO_4$, or H_2SO_4
(5.48α)(0.060γ(θ)) = $1 + A_2P_2(\cos\theta)$
A_2 is negative $|A_2| > 0.36$ *2*
Collective model* estimates $|A_2| = 0.35$

57K52 V.E.Krohn, T.B.Novey, S.Raboy, Phys. Rev. 105, 234 (1957); Bull. Am. Phys. Soc. 1, No. 7, 330 J2 (1956). *A.Bohr, et al., Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 29, No. 10 (1955).

$Am^{242}_{95\ 147}$ 16^h

γ(Pu^{242})	**0.04450** *6*	sπ ce
γ(Cm^{242})	**0.04212** *6*	

56A41 R.G.Albridge, B.G.Harvey, J.M. Hollander, quoted by J.M.Hollander, Phys. Rev. 103, 1590 (1956).

$Am^{243}_{95\ 148}$ 7600^y

τ **7600^y** Pu^{242}(pile n,$\gamma\beta$) chem specific α activity

57B149 J.P.Butler, T.A.Eastwood, R.P. Schuman, quoted by Butler et. al., Can. J. Phys. 35, 147 (1957).

$Am^{246}_{95\ 151}$ 25^m

$11^d Pu^{246}$ source

β^-	~ 1.1			scin $\beta\gamma$
	79†	**1.31**		s, scin
	14†	**1.60**		scin
	~ 7†	**2.10**		
γ(Cm^{246})	~ 0.035		w **0.245**	scin
	0.100?		$\sim$**0.78**	(complex)
	0.175 to 0.180?		$\sim$**1.06**	(complex)

E_{dis} = 2.41 *10* from ($\sim$1.6β)(0.8γ); ($\sim$1.31β)(1.1γ)
$\gamma\gamma$ and $\beta\gamma$ studied; results listed in their tables 2 and 3

56S85 H.L.Smith, C.I.Browne, D.C.Hoffman, J.P.Mize, M.E.Bunker, J. Inorg. Nuclear Chem. 3, 93 (1956).

$Cm^{242}_{96\ 146}$ 162^d

γ(Pu^{238}) **0.0441** sd ce
$L_2:L_3:M_2:M_3:N_2$ = 495:420:325:170:80

56B95 S.A.Baranov, K.N.Shlyagin, J. Nuclear Energy 3, 132 (1956); Soviet J. Atomic Energy No. 1, 51 (1956).

γ(Pu^{238}) Am^{241}(n,$\gamma\beta$) chem

390 *70*†	**0.04403** *6*		pc in magnetic field
35 *8*†	**0.10180** *17*		
23 *5*†	**0.1576** *3*		
x	**L x ray**		

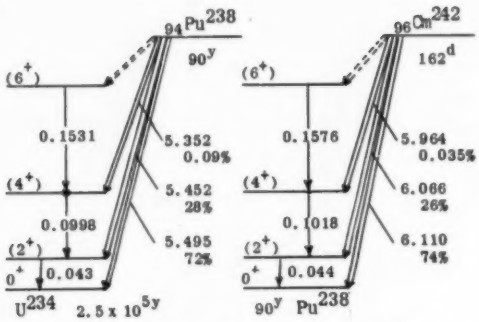
†Photons per $10^6\alpha$'s. Compared 0.044γ intensity and α-decay rate to those of Am^{241} using 0.060γ/α = 0.40 ±0.025.

56N17 J.O.Newton, B.Rose, J.Milsted, Phil. Mag. 1, 981 (1956).

Continued

Cm^{242} 96 146 162^d

Continued



56N17 J.O.Newton, B.Rose, J.Milsted, Phil. Mag. 1, 981 (1956); F.Asaro, I.Perlman, Phys. Rev. 94, 381 (1954).

Cm^{243} 96 147 35^y

τ **35.0**^{y} specific activity

56T29 S.G.Thompson, U.S. patent 2,741,627; Chem. Abstr. 50, 11849a (1956); priv. comm.

Pu^{239}(pile n) chem

$\alpha(0.277\gamma)$ delay $\sim 1.2^{m\mu s}$ scin

56S123 D.Strominger, UCRL-3374 (1956).

$\gamma(Pu^{239})$ $Am^{241}(2n,\gamma\beta)$ chem

	50 15†	**0.210** 2	pc in magnetic field
	65 15†	**0.228** 2	
	100 †	**0.277** 2	
x	360 40†	**0.1022** 2 (K_α x ray)	
	140 20†	**0.1173** 4 (K_β x ray)	

56N17 J.O.Newton, B.Rose, J.Milsted, Phil. Mag. 1, 981 (1956).

Cm^{247} 96 151 $>4 \times 10^{7y}$

τ_α $>4 \times 10^{7y}$

No Pu^{243} $\beta(0.084\gamma)$ coincidences found scin

57D31 H.Diamond, A.M.Friedman, J.E.Gindler, P.R.Fields, Phys. Rev. 105, 679 (1957).

Cf^{249} 98 151 $\sim 470^y$

extracted from 290^d Bk^{249}

$\alpha(0.340, 0.395\gamma)$ delay $<0.8^{m\mu s}$ scin

56S123 D.Strominger, UCRL-3374 (1956).

Cf^{250} 98 152 9.3^y

τ **9.3**^{y}

56B100 J.P.Butler, T.A.Eastwood, T.L. Collins, F.M.Rourke, R.P.Schuman, quoted by Butler et al. Phys. Rev. 103, 965 (1956).

$\gamma(Cm^{246})$ **0.0429** *1* sm ce

56H64 B.G.Harvey, J.M.Hollander, quoted by J.M.Hollander, Phys. Rev. 103, 1590 (1956)

Cf^{252} 98 154 2.2^y

$\gamma(Cm^{248})$ **0.0434** *1* sm ce

56H64 B.G.Harvey, J.M.Hollander, quoted by J.M.Hollander, Phys. Rev. 103, 1590 (1956).

E^{247} 99 148 7.3^m

τ $\sim 7^m$ U(100-Mev N^{14}) chem

From decay of 7.0 to 7.5 Mev α's ic

56G59 L.I.Guseva, K.V.Filippova, Y.B.Gerlit, V.A.Druin, B.F.Myasoedov, N.I.Tarantin, Atom. Energiya 1, No. 2, 50 (1956); J. Nuclear Energy 3, 341 (1956).

E^{248} 99 149 25^m

Cf^{249}(16- to 22-Mev d,3n) chem

τ **25**^{m} *5*

α **6.87** 2 ic

$\epsilon/\alpha \sim 400$ from ($225^d Cf^{248}$ 6.28α)/($25^m E^{248}$ 6.87α)

56C67 A.Chetham-Strode, L.W.Holm, Phys. Rev. 104, 1314 (1956).

E^{249} 99 150 2^h

Bk^{249},Cf^{249}(34- to 40-Mev α) chem

τ 2^h

α **6.76** ic

$\epsilon/\alpha = 760$

56H80 B.G.Harvey, A.Chetham-Strode, A. Ghiorso, G.R.Choppin, S.G.Thompson, Phys. Rev. 104, 1315 (1956).

E^{250} 99 151 8^h

Bk^{249},Cf^{249}(29- to 40-Mev α) chem

τ 8^h

No α observed ic

56H80 B.G.Harvey, A.Chetham-Strode, A. Ghiorso, G.R.Choppin, S.G.Thompson, Phys. Rev. 104, 1315(1956)

E^{251} 99 152 1.5^d

Bk^{249}(24- to 40-Mev α,2n) chem

τ 1.5^d

α **6.48** ic

$\epsilon/\alpha = 190$

56H80 B.G.Harvey, A.Chetham-Strode, A. Ghiorso, G.R.Choppin, S.G.Thompson, Phys. Rev. 104, 1315 (1956).

E^{252} 99 153 $\sim 140^d$

Bk^{249}(24- to 40-Mev α,n) chem

τ $\sim 140^d$

α **6.64** ic

No β^- ($\tau_\beta > 20^y$) ϵ not observed

56H80 B.G.Harvey, A.Chetham-Strode, A. Ghiorso, G.R.Choppin, S.G.Thompson, Phys. Rev. 104, 1315 (1956).

Fm^{250} 100 150 30^m

τ 30^m U(120-Mev O^{16}) chem

α **7.7** 2 ic, ppl

56G59 L.I.Guseva, K.V.Filippova, Y.B.Gerlit, V.A.Druin, B.F.Myasoedov, N.I.Tarantin, Atom. Energiya 1, No. 2, 50 (1956); J. Nuclear Energy 3, 341 (1956).

Fm^{250} 100 150 30^{m}

τ 30^{m} 3 ~470^{y}Cf^{249}(α,3n) chem

α 7.43 5

No ε (< 10%)

Mass assignment from excitation function

57A47 S.Amiel, A.Chetham-Strode,Jr., G.R. Choppin, A.Ghiorso, B.G.Harvey, L.W.Holm, S.G.Thompson, Phys. Rev. 106, 553 (1957).

Fm^{251} 100 151 7^{h}

τ 7.0^{h} 7 ~470^{y}Cf^{249}(α,2n) chem

α 6.89 5

ε/α~100

Mass assignment from excitation function

57A47 S.Amiel, A.Chetham-Strode,Jr., G.R. Choppin, A.Ghiorso, B.G.Harvey, L.W.Holm, S.G.Thompson, Phys. Rev. 106, 553 (1957).

Fm^{252} 100 152 23^{h}

τ 30^{h} 3 ~470^{y}Cf^{249}(α,n) chem

α 7.05 5

Mass assignment from excitation function

57A47 S.Amiel, A.Chetham-Strode,Jr., G.R. Choppin, A.Ghiorso, B.G.Harvey, L.W.Holm, S.G.Thompson, Phys. Rev. 106, 553 (1957).

Fm^{253} 100 153 4.5^{d}

τ 4.5^{d} 10 Cf^{252}(40-Mev α,3n) chem

α 6.94 4 ic

ε/α~8.5 from (E^{253} 6.64α)/(Fm^{253} 6.94α)

57A49 S.Amiel, Phys. Rev. 105, 1412 (1957).

2. NEUTRON CROSS SECTIONS

In all cases where cross sections have been measured with monoenergetic neutrons, the neutron energy is given in the energy column. Absorption cross sections for neutron energies marked "th" (thermal) have been determined, from measurements in a thermal neutron flux, in terms of the cross section value of a "standard" for neutrons of velocity 2200 m/sec, or energy ~0.025 ev. The standard used, when clearly stated by the experimenter, is given just after the reference and is generally one known to have a thermal absorption cross section with 1/v energy dependence. If the nucleus whose cross section is being measured also has a cross section with 1/v dependence, the cross section found for it by comparison with the standard will, of course, be a cross section for 2200 m/sec. If not, and the dependence often is not known, the value found by the comparison is $\overline{\sigma v}/2200$.

In the column headed "Type of σ" we now follow the notation proposed by H. Goldstein of Nuclear Development Corporation of America, White Plains, N.Y. in a report entitled A Proposed Nomenclature Scheme for Experimental Nuclear Cross Section, NDA 2-33 May 28, 1956. The abbreviations for the different types of neutron cross sections are as follows:

nT	total
nX	total minus elastic (nT - n,n)
nS	scattering
nA	absorption (nT - nS)
n,f	fission
n,γ; n,α...	absorption with emission of γ, α, etc.
n,n	elastic scattering
n, 2.1n′	inelastic scattering for the production of 2.1-Mev scattered neutrons
n, 2.1n′(90°)	differential inelastic scattering (in barns/steradian) for the production of 2.1-Mev scattered neutrons at 90° to the incident beam
n, n′(0.9γ)	inelastic scattering for the production of 0.9-Mev γ's. The energy loss in the inelastic process is $\geq$0.9 Mev depending on whether or not other γ's are emitted in cascade with the 0.9-Mev γ.

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
H^1	0.060 to 0.550	nT	table		55A53
H^2	2.45, 3.27	n,n(θ)	graphs	scin n	57S35
Li^6	th	n,γ	0.023 *8*	sπ pr	56B141
	0.01 to 0.45	nT	graph		56G62
Li^7	0.01 to 0.45	nT	graph		56G62
Be^9	RaBe, PoBe	n,2n	0.37 *6*	Szilard Chalmers	56E15
	0.7 to 4.4	n,α	graph	0.8 ^{8}He	57S95
	3.8 to 8.1	nT	table		57B113
	7.0	nX	0.60 *4*	sphere	56B132
	7.0	n,n′	table	sphere	56B132
	7	nX	0.76 *5*	sphere	57B02
	8	nX	0.70 *4*	sphere	57B02
	11	nX	0.63 *5*	sphere	57B02
	14	n,n′	~0	ppl	57R58
	14	n,2n	0.42 *7*	ppl	57R58
	14.2	n,n(θ)	table	scin n	57A52
B	th	nA	756 *6*	cryst	57H18
B^{10}	th	n,γ	0.5 *2*	sπ pr	56B141
B(10)	pile	n,p	>0.007	2.5x10^6 ^{7}Be	56C51
C	14 to 10^3ev	nT	4.69 *10*		56B128
	0.060 to 0.550	nT	table		55A53
	2.5, 7.0	n,n′	table	sphere	56B132
	2.5	nX	0.05 *5*	sphere	56B132
	7.0	nX	0.17 *3*	sphere	56B132
	7.0	n,n(θ)	graph		56B132
	2.74	nT	1.74 *3*		57B50
	3.8 to 8.1	nT	table		57B113
	~120	nA	0.188 *8*		56G63
C(12)	17.3	n,p	0.029 *23*	4.4γ of ^{18}B	56K40
N^{14}	14	n,d(θ)	graph	scin d	57C07
	14	n,d(3.68 level)(θ)	graph	scin d	57C07
N^{15}	2.8 to 3.3	nT	graph		56B107
F^{19}	0.66 to 2.92	n,n(θ)	graphs	pc	55W48

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
F^{19}	1.4 to 3.7	$n,n'(1.24\gamma)$	graph	scin γ	57F22
	1.4 to 3.7	$n,n'(1.36\gamma)$	graph	scin γ	57F22
	3.2 to 3.7	$n,n'(2.59\gamma)$	graph	scin γ	57F22
	2.74	nT	2.86 *2*		57B50
	3.8 to 8.1	nT	table		57B113
	14.1	$n,d(\theta)$	graph	scin	57R40
Ne	1.9 to 3.5	nT	graph		57S55
Na^{23}	th	n,γ	0.536 *6*	$\beta\gamma$ of $15^{h}Na$	56C42
	~25 kev	n,γ	0.0010 *2*	$15^{h}Na$	57M16
	~25 kev	n,γ	0.0010 *2*	$15^{h}Na$	57B105
	0.77	nX	<0.2	sphere	56P45
	1.0	nX	0.4 *2*	sphere	56P45
	2.5	nX	0.53 *26*	sphere	57S98
Mg	250 to 10^{4}ev	nT	3.60 *20*		56B120
	2.5	nX	0.77 *25*	sphere	57S98
	2.74	nT	2.523 *5*		57B50
	8	nX	1.04 *5*	sphere	57B02
	11	nX	1.06 *5*	sphere	57B02
Mg^{26}	pile	n,γ	$\leq$0.04		57R48
$Mg^{(26)}$	~25 kev	n,γ	<0.014	$9.5^{m}Mg$	57M16
Al^{27}	~25 kev	n,γ	0.0014 *2*	$2.3^{m}Al$	57M16
	0.77	nX	<0.1	sphere	56P45
	1.0	nX	0.2 *1*	sphere	56P45
	f spectrum	$n,<0.7n'$	0.087 *32*	sphere	57B54
	f spectrum	$n,<1.4n'$	0.319 *46*	sphere	57B54
	f spectrum	$n,<5n'$	0.72 *4*	sphere	57B54
	1.8 to 7	n,n'	table	sphere	56B132
	1.8 to 7	nX	table	sphere	56B132
	2.5, 7.0	$n,n(\theta)$	graph		56B132
	2.5	nX	0.96 *17*	sphere	57S98
	2.74	nT	2.69		57B50
	4.4	$n,n(82°)$	0.046 *10*	ppl	56W36
	4.4	$n,3.5n'(82°)$	0.019 *7*	ppl	56W36
	4.4	$n,2.2n'(82°)$	0.015 *5*	ppl	56W36
	4.4	$n,1.6n'(82°)$	<0.003	ppl	56W36
	4.4	$n,1.4n'(82°)$	0.010 *5*	ppl	56W36
	7	nX	1.05 *5*	sphere	57B02
	8	nX	1.01 *5*	sphere	57B02
	11	nX	1.12 *5*	sphere	57B02
	13.2	$n,p+n,np$	0.14 *3*	ppl	57B127
	14	$n,p+n,np$	0.14 *3*	ppl	57A30
	14	n,p	~0.079 *15*	ppl	57H11
	14.1	n,p	0.087 *7*	$9.5^{m}Mg$	57Y02
	14.1	n,α	0.120 *24*	$15^{h}Na$	57Y02

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
Al^{27}	14.8	$n,\alpha(\theta)$	graph	ppl	57K61
	14.8	n,α	0.092 *15*	ppl	57K61
	~380	nA	0.258 *23*		56G63
Si	250 to 10^{4}ev	nT	2.43 *20*		56B120
$Si^{(30)}$	~25 kev	n,γ	0.0016 *14*	$2.6^{h}Si$	57B105
P^{31}	2.5	nX	0.7 *2*	sphere	57S98
S	250 to 10^{4}ev	nT	1.17 *10*		56B120
	0.4 to 1.2	nT	graph		56H82
	2.5	nX	0.54 *21*	sphere	57S98
	7.0	n,n'	table	sphere	56B132
	7.0	nX	1.14 *7*	sphere	56B132
Cl	0.03ev to 10kev	nT	graph		56B128
	2.5	nX	0.6 *3*	sphere	57S98
$Cl^{(37)}$	~25 kev	n,γ	0.0011 *2*	$37^{m}Cl$	57M16
A	0.07ev	nT	0.96		57H42
A^{36}	0.07ev	nT	77 *9*		57H42
A^{40}	0.07ev	nS	0.36		57H42
KCl	7.0	n,n'	table	sphere	56B132
	7.0	nX	1.12 *11*	sphere	56B132
$K^{(41)}$	~25 kev	n,γ	<0.02	$12.5^{h}K$	57M16
	~25 kev	n,γ	0.019 *5*	$12.5^{h}K$	57B105
Ca	2.5	nX	0.4 *2*	sphere	57S98
	4.4	$n,n(82°)$	0.049 *12*	ppl	56W36
	7.0	n,n'	table	sphere	56B132
	7.0	nX	1.14 *7*	sphere	56B132
$Ca^{(42)}$	th	n,γ	$<6.6^{+30}_{-60}$	capture γ	56A49
Sc^{45}	~1 to 100kev	nT	graph		57M10
	~25 kev	n,γ	0.057 *30*	$85^{d}Sc$	57B105
Ti	1.0 to 7	n,n'	table	sphere	56B132
	1.0 to 7	nX	table	sphere	56B132
	f spectrum	$n,<0.7n'$	0.187 *37*	sphere	57B54
	f spectrum	$n,<1.4n'$	0.563 *51*	sphere	57B54
$Ti^{(50)}$	~25 kev	n,γ	0.005 *3*	$5.8^{m}Ti$	57M16
V^{51}	~1 to 100kev	nT	graph		57M10

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
V^{51}	~25 kev	n,γ	0.050 5	$3.8^{m}V$	57M16
	f spectrum	n, <0.7n′	0.224 46	sphere	57B54
	f spectrum	n, <1.4n′	0.575 50	sphere	57B54
Cr	2.5	nX	1.4 3	sphere	57S98
	4.4	n,n(90°)	0.037 7	ppl	56W36
$Cr^{(52)}$	4.4	n,3.0n′(90°)	0.014 5	ppl	56W36
	4.4	n,2.0n′(90°)	0.005 2.5	ppl	56W36
	4.4	n,1.3n′(90°)	0.014 7	ppl	56W36
Mn^{55}	th	nA	13.2 2	osc	56C76
	~1 to 100kev	nT	graph		57M10
	~25 kev	n,γ	0.055 6	$2.6^{h}Mn$	57M16
	~25 kev	n,γ	0.047 9	$2.6^{h}Mn$	57B105
Fe	1.0	nX	0.3 1	sphere	56P45
	1.0 to 7	n,n′	table	sphere	56B132
	1.0 to 7	nX	table	sphere	56B132
	2.5,7.0	n,n(θ)	graph		56B132
	f spectrum	n, <0.7n′	0.276 31	sphere	57B54
	f spectrum	n, <1.4n′	0.686 43	sphere	57B54
	f spectrum	n, <5n′	1.20 8	sphere	57B54
Fe	2.5	nX	1.16 12	sphere	57S98
	2.74	nT	3.57 3		57B50
	4.4	n,n(90°)	0.032 5	ppl	56W31
	4.4 n,0.8 to 3.7n′(90°)		0.032 10	ppl	56W31
Fe^{54}	14	n,p+n,np	0.68 14	ppl	57A30
	14	n,2n	0.010 4	$9^{m}Fe$	57A30
Fe^{56}	14	n,p	0.19 4	ppl	57A30
$Fe^{(56)}$	13.2	n,p	0.12 3	ppl	57B127
	14	n,n′(0.85γ)	0.75 8	scin γ	55M99
	14	n,n′(1.25γ)	0.26 3	scin γ	55M99
	14	n,p	0.072 7	$2.6^{h}Mn$	55M99
	14.1	n,p	0.144 18	$2.6^{h}Mn$	57Y02
Co^{59}	~1 to 100kev	nT	graph		57M10
	2.5	nX	1.40 11	sphere	57S98
	3.8 to 8.1	nT	table		57B113
	4.4	n,n(90°)	0.050 10	ppl	56W31
	4.4 n,0.8 to 3.7n′(90°)		0.044 12	ppl	56W31
Ni	1.0	nX	<0.1	sphere	56P45
	1.0 to 7.0	n,n′	table	sphere	56B132
	1.0	nX	0.06 3	sphere	56B132
	2.5	nX	0.80 6	sphere	56B132
	7.0	nX	1.48 6	sphere	56B132
	f spectrum	n, <0.7n′	0.276 41	sphere	57B54
	f spectrum	n, <1.4n′	0.713 48	sphere	57B54
	f spectrum	n, <5n′	1.31 8	sphere	57B54

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
Ni	2.5	nX	0.83 12	sphere	57S98
	4.4	n,n(90°)	0.032 5	ppl	56W31
	4.4 n,0.8 to 3.7n′(90°)		0.020 7	ppl	56W31
Ni^{58}	14	n,p+n,np	0.53 11	ppl	57A30
Ni^{60}	14	n,p+n,np	0.30 6	ppl	57A30
$Ni^{(62)}$	pile	n,γ	21 2	$125^{y}Ni$	56M95
$Ni^{(64)}$	~25 kev	n,γ	0.007 2	$2.6^{h}Ni$	57B105
Cu	1.0	nX	0.2 1	sphere	56P45
	f spectrum	n, <0.7n′	0.304 46	sphere	57B54
	f spectrum	n, <1.4n′	0.900 53	sphere	57B54
	f spectrum	n, <5n′	1.41 10	sphere	57B54
	2.5	nX	1.58 15	sphere	57S98
	2.5	nX	1.27 6	sphere	56B132
	7.0	nX	1.54 6	sphere	56B132
	2.5, 7.0	n,n′	table	sphere	56B132
	2.74	nT	3.16 1		57B50
	3.3	n,n(θ)	graph	scin n	56R47
	7	nX	1.64 6	sphere	57B02
	8	nX	1.58 5	sphere	57B02
	11	nX	1.60 5	sphere	57B02
Cu^{63}	~1 to 100kev	nT	graph		57M10
	14	n,p+n,np	0.25 5	ppl	57A30
$Cu^{(63)}$	pile	n,p	0.0031 5	$125^{y}Ni$	57P48
	~25 kev	n,γ	0.116 12	$13^{h}Cu$	57M16
	~25 kev	n,γ	0.099 17	$13^{h}Cu$	57B105
	14.1	n,2n	0.556 27	$10^{m}Cu$	57Y02
Cu^{65}	~1 to 100kev	nT	graph		57M10
	14	n,p	<0.04	ppl	57A30
$Cu^{(65)}$	~25 kev	n,γ	0.046 5	$5.1^{m}Cu$	57M16
	~25 kev	n,γ	0.042 9	$5.1^{m}Cu$	57B105
Zn	f spectrum	n, <0.7n′	0.305 47	sphere	57B54
	f spectrum	n, <1.4n′	0.955 55	sphere	57B54
	2.5	nX	1.88 15	sphere	57S98
	2.5	nX	1.30 10	sphere	56B132
	7.0	nX	1.61 10	sphere	56B132
	2.5, 7.0	n,n′	table	sphere	56B132
	2.74	nT	3.34 2		57B50
	14	n,n(θ)	graph	scin n	56N23
Zn^{64}	2.75kev	nT	940		56D42
	4.6 kev	nT	560		56D42
$Zn^{(64)}$	14.1	n,2n	0.119 14	$38^{m}Zn$	57Y02
$Zn^{(66)}$	th	n,γ	~1	$9^{\mu s}Zn$	56P40
	14.1	n,p	0.060 7	$5.1^{m}Cu$	57Y02
Zn^{67}	225 to 2300ev	nT	table		56D42
Zn^{68}	530 ev	nT	4700		56D42

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
$Zn^{(68)}$	~25 kev	n,γ	**0.0047** *9*	$14^{h}Zn$	57B105
	~25 kev	n,γ	**0.022** *9*	$52^{m}Zn$	57B105
$Ga^{(71)}$	~25 kev	n,γ	**0.068** *13*	$14^{h}Ga$	57M16
Ge	0.06 to 0.65	nT	**graph**		56Z04
	3.8 to 8.1	nT	**table**		57B113
Ge^{74}	th	n,γ	**0.18** *4*	$82^{m}Ge$	57M01
	th	n,γ	**0.040** *8*	$49^{s}Ge$	57M01
$Ge^{(74)}$	~25 kev	n,γ	**0.054** *8*	$82^{m}Ge$	57M16
Ge^{76}	th	n,γ	**0.063** *15*	$12^{h}Ge$	57M01
	th	n,γ	**0.075** *15*	$52^{s}Ge$	57M01
Se	0.06 to 0.65	nT	**graph**		56Z04
	2.5	nX	**1.88** *17*	sphere	57S98
	14	n,n'(θ)	**graph**	scin n	57N02
As^{75}	0.06 to 3	nT	**graph**		56Z04
	~25 kev	n,γ	**0.74** *7*	$26.5^{h}As$	57M16
	~25 kev	n,γ	**0.56** *14*	$26.5^{h}As$	57B105
Br	0.06 to 3	nT	**graph**		56Z04
$Br^{(81)}$	~25 kev	n,γ	**0.550** *55*	$36^{h}Br$	57M16
$Rb^{(85)}$	~25 kev	n,γ	**0.181** *35*	$19^{d}Rb$	57M16
$Rb^{(87)}$	~25 kev	n,γ	**0.075** *15*	$18^{m}Rb$	57M16
Y^{89}	~25 kev	n,γ	**0.025** *5*	$64^{h}Y$	57B105
	2.74	nT	**4.2** *2*		57B50
Zr	th	nA	**0.174** *8*	osc	56C76
	1.0 to 7	n,n'	**table**	sphere	56B132
	1.0 to 7	nX	**table**	sphere	56B132
	2.5,7.0	n,n(θ)	**graph**		56B132
	f spectrum	n, <0.7n'	**0.302** *50*	sphere	57B54
	f spectrum	n, <1.4n'	**0.960** *59*	sphere	57B54
	f spectrum	n, <5n'	**1.57** *9*	sphere	57B54
	8	nX	**1.74** *5*	sphere	57B02
	11	nX	**1.82** *6*	sphere	57B02
$Zr^{(94)}$	~25 kev	n,γ	**0.243** *36*	$65^{d}Zr$	57M16
$Zr^{(96)}$	~25 kev	n,γ	**0.022** *4*	$74^{m}Nb$	57M16
Nb^{93}	0.77 to 1.8	n,n'(0.736γ)	**graph**	scin γ	57R55
	1.0 to 1.8	n,n'(0.957γ)	**graph**	scin γ	57R55
Mo	2.5	nX	**1.9** *3*	sphere	57S98
$Mo^{(92)}$	14.1	n,2n	**0.132** *21*	$16^{m}Mo$	57Y02
$Mo^{(98)}$	~25 kev	n,γ	**0.209** *21*	$67^{h}Mo$	57M16
	~25 kev	n,γ	**0.34** *10*	$67^{h}Mo$	57B105

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
$Mo^{(100)}$	~25 kev	n,γ	**0.038** *8*	$15^{m}Mo$	57M16
	~25 kev	n,γ	**0.045** *9*	$14^{m}Tc$	57M16
$Ru^{(96)}$	~25 kev	n,γ	**0.32** *6*	$2.4^{d}Ru$	57M16
$Ru^{(102)}$	~25 kev	n,γ	**0.386** *39*	$40^{d}Ru$	57M16
$Ru^{(104)}$	~25 kev	n,γ	**0.211** *21*	$4.4^{h}Ru$	57M16
Rh^{103}	0.3 to 1.2	n,n'(0.300γ)	**graph**	scin γ	57R55
	0.4 to 1.2	n,n'(0.365γ)	**graph**	scin γ	57R55
	13.2	n,p	**0.025** *5*	ppl	57B127
$Pd^{(108)}$	~25 kev	n,γ	**0.54** *6*	$14^{h}Pd$	57M16
	~25 kev	n,γ	**0.48** *14*	$14^{h}Pd$	57B105
$Pd^{(110)}$	~25 kev	n,γ	**>0.30**	$22^{m}Pd$	57B105
Ag	th	nA	**63.1** *9*	osc	56C76
	0.4 to 29ev	nT	**graph**	cryst	56W38
	4.5 to 5.8ev	nS	**graph**	cryst	56W38
	16 to 81ev	nT	**tables**		56F28
	1.0 to 7.0	n,n'	**table**	sphere	56B132
	1.0	nX	**1.72** *20*	sphere	56B132
	2.5	nX	**2.08** *12*	sphere	56B132
	7.0	nX	**2.00** *10*	sphere	56B132
	f spectrum	n, <0.7n'	**0.84** *10*	sphere	57B54
	f spectrum	n, <1.4n'	**1.66** *9*	sphere	57B54
	f spectrum	n, <5n'	**1.99** *10*	sphere	57B54
	2.5	nX	**2.1** *2*	sphere	57S98
$Ag^{(107)}$	~25 kev	n,γ	**0.93** *18*	$2.3^{m}Ag$	57M16
	14.1	n,2n	**0.458** *50*	$24^{m}Ag$	57Y02
$Ag^{(109)}$	14.1	n,2n	**0.604** *66*	$2.3^{m}Ag$	57Y02
Cd	0.3	nX	**<0.1**	sphere	56P45
	0.77	nX	**0.6** *2*	sphere	56P45
	1.0	nX	**1.0** *2*	sphere	56P45
	1.0 to 7	n,n'	**table**	sphere	56B132
	1.0 to 7	nX	**table**	sphere	56B132
	f spectrum	n, <0.7n'	**0.658** *79*	sphere	57B54
	f spectrum	n, <1.4n'	**1.52** *8*	sphere	57B54
	f spectrum	n, <5n'	**2.14** *11*	sphere	57B54
	2.5	nX	**2.2** *2*	sphere	57S98
In	th	nA	**200** *3*	osc	56C76
$In^{(113)}$	~25 kev	n,γ	**7.4** *25*	$49^{d}In$	57B105
$In^{(115)}$	~25 kev	n,γ	**0.80** *8*	$54^{m}In$	57M16
	~25 kev	n,γ	**0.60** *13*	$54^{m}In$	57B105
Sn	0.77	nX	**<0.1**	sphere	56P45
	1.0	nX	**0.4** *2*	sphere	56P45
	f spectrum	n, <0.7n'	**0.369** *50*	sphere	57B54
	f spectrum	n, <1.4n'	**1.12** *6*	sphere	57B54
	f spectrum	n, <5n'	**2.01** *11*	sphere	57B54
	1.8 to 7	n,n'	**table**	sphere	56B132

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
Sn	1.8 to 7	nX	table	sphere	56B132
	2.5,7.0	n,n(θ)	graph		56B132
	2.5	nX	2.2 *2*	sphere	57S98
	8	nX	2.00 *5*	sphere	57B02
	11	nX	2.01 *7*	sphere	57B02
	14.6	n,n(θ)	table	scin n	57G02
	380	nT	1.88 *4*		55D46
	500	nT	1.93 *3*		55D46
	590	nT	1.98 *4*		55D46
	630	nT	2.03 *4*		55D46
Sb	0.77	nX	0.4 *2*	sphere	56P45
	1.0	nX	0.7 *3*	sphere	56P45
	2.5	nX	1.9 *2*	sphere	57S98
	14	n,n(θ)	graph	scin n	57N02
$Sb^{(121)}$	~25 kev	n,γ	0.95 *10*	$2.75^{d}Sb$	57M16
	~25 kev	n,γ	0.71 *15*	$2.75^{d}Sb$	57B105
$Sb^{(123)}$	~25 kev	n,γ	0.456 *46*	$61^{d}Sb$	57M16
	~25 kev	n,γ	0.214 *80*	$61^{d}Sb$	57B105
Te	2.5	nX	2.00 *35*	sphere	57S98
I^{127}	~25 kev	n,γ	0.82 *6*	$25^{m}I$	57M20
	2.5	nX	1.96 *25*	sphere	57S98
$Xe^{(124)}$	pile	n,γ	74.4	$19^{h}Xe$	57T19
Cs^{133}	~25 kev	n,γ	0.0005 *3*	$3.1^{h}Cs$	57B105
	~25 kev	n,γ	0.75 *26*	$2.3^{y}Cs$	57B105
Ba	2.5	nX	1.6 *10*	sphere	57S98
Ba^{130}	th	n,γ	9.5 *10*	$10^{d}Cs$	55L58
$Ba^{(138)}$	~25 kev	n,γ	0.0114 *11*	$85^{m}Ba$	57M16
La^{139}	~25 kev	n,γ	0.050 *7*	$40^{h}La$	57M16
	~25 kev	n,γ	0.043 *13*	$40^{h}La$	57B105
$Ce^{(140)}$	~25 kev	n,γ	0.031 *4*	$33^{d}Ce$	57M16
$Ce^{(142)}$	~25 kev	n,γ	0.425 *43*	$33^{h}Ce$	57M16
Pr^{141}	~25 kev	n,γ	0.547 *55*	$19^{h}Pr$	57M16
	~25 kev	n,γ	0.149 *30*	$19^{h}Pr$	57B105
Sm	th	nA	9630 *90*	osc	56C76
$Sm^{(149)}$	th	nA	66,000 *800*	osc	57C75
	pile	nA	74,500 *1100*	osc	57A22
$Sm^{(152)}$	~25 kev	n,γ	0.67 *10*	$47^{h}Sm$	57M16

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
$Sm^{(154)}$	~25 kev	n,γ	0.53 *7*	$24^{m}Sm$	57M16
Eu	th	nA	4010 *40*	osc	56C76
Gd	th	nA	40900 *510*	osc	56C76
$Gd^{(158)}$	~25 kev	n,γ	0.71 *7*	$18^{h}Gd$	57M16
$Tb^{(160)}$	pile	n,γ	525 *100*	$7^{d}Tb$	56S103
Dy	th	nA	920 *30*	osc	56C76
$Dy^{(164)}$	~25 kev	n,γ	0.293 *90*	$2.3^{h}Dy$	57B105
$Er^{(170)}$	~25 kev	n,γ	0.298 *30*	$7.8^{h}Er$	57M16
Tm^{169}	0.04 to 1.5ev	nT	graph	cryst	56J27
$Hf^{(180)}$	~25 kev	n,γ	0.441 *66*	$45^{d}Hf$	57M16
Ta^{181}	0.6 to 14ev	ns	graph	cryst	56W38
	14 to 54ev	nT	tables		56F28
	34 to 10^{4}ev	nT	graph		57R06
	~25 kev	n,γ	1.22 *26*	$111^{d}Ta$	57B105
	2.5, 7.0	n,n′	table	sphere	56B132
	2.5,7.0	n,n(θ)	graph		56B132
	2.5	nX	2.90 *35*	sphere	56B132
	7.0	nX	2.5 *2*	sphere	56B132
	3.3	n,n(θ)	graph	scin n	56R47
	14	n,n′	0.17 *3*	ppl	57R58
	14	n,2n	1.8 *3*	ppl	57R58
W	0.3	nX	0.4 *2*	sphere	56P45
	0.77	nX	1.3 *4*	sphere	56P45
	1.0	nX	2.6 *8*	sphere	56P45
	1.0 to 7.0	n,n′	table	sphere	56B132
	1.0	nX	2.25 *30*	sphere	56B132
	2.5	nX	2.66 *30*	sphere	56B132
	7.0	nX	2.45 *20*	sphere	56B132
	f spectrum	n, <0.7n′	1.08 *14*	sphere	57B54
	f spectrum	n, <1.4n′	2.23 *13*	sphere	57B54
	f spectrum	n, <5n′	2.72 *16*	sphere	57B54
	2.5	nX	2.60 *25*	sphere	57S98
	14	n,n(θ)	graph	scin n	57N02
	~120	n,f	0.0011		55D49
	~380	n,f	0.0038		55G69
$W^{(186)}$	~25 kev	n,γ	0.296 *44*	$24^{h}W$	57M16
	~25 kev	n,γ	0.232 *50*	$24^{h}W$	57B105

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
Re	~120	n, f	0.0017		55D49
$Re^{(185)}$	~25 kev	n, γ	2.65 *50*	3.7^{d}Re	57M16
$Re^{(187)}$	~25 kev	n, γ	0.97 *20*	17^{h}Re	57M16
Os	th	nS coh	15.20	cryst	57H41
	th	nS bound	15.36	cryst	57H41
$Os^{(190)}$	~25 kev	n, γ	0.87 *13*	15^{d}Os	57M16
Ir	4.5 to 12.5ev	nT	graph		57R06
Ir^{192}	pile	n, γ	1500	12^{d}Ir	57B112
Pt	~380	n, f	0.012		55G69
$Pt^{(196)}$	~25 kev	n, γ	0.190 *80*	19^{h}Pt	57B105
$Pt^{(198)}$	~25 kev	n, γ	0.200 *50*	30^{m}Pt	57B105
$Pt^{(199)}$	pile	n, γ	~15	11.5^{h}Pt	57R49
Au^{197}	0.0253ev	nA	98.8 *3*	1/v line	57G25
	4.5 to 5.4ev	nS	graph	cryst	56W38
	~25 kev	n, γ	1.12 *11*	2.7^{d}Au	57M16
	~25 kev	n, γ	0.79 *16*	2.7^{d}Au	57B105
	0.5	n, n(θ)	graph	recoil p	56A42
	1.0 to 7.0	n, n'	table	sphere	56B132
	1.0 to 7.0	nX	table	sphere	56B132
	f spectrum	n, <0.7n'	1.00 *12*	sphere	57B54
	f spectrum	n, <1.4n'	2.04 *11*	sphere	57B54
	f spectrum	n, <5n'	2.68 *16*	sphere	57B54
	14	n, ≥5.4 Mev p	≥0.0205	ppl	57P18
	~120	n, f	0.010		55R58
	~380	n, f	0.020		55G69
Hg	0.3	nX	0.10 *6*	sphere	56P45
	0.77	nX	0.8 *2*	sphere	56P45
	1.0	nX	1.5 *4*	sphere	56P45
	2.5	nX	2.6 *3*	sphere	57S98
	14	n, n(θ)	graph	scin n	56N23
$Hg^{(202)}$	~25 kev	n, γ	0.057 *13*	47^{d}Hg	57M16
Tl	th	nS coh	10.04	cryst	57H41
	th	nS bound	10.14	cryst	57H41
	~120	n, f	0.010		55R58
	~380	n, f	0.019		55G69
Pb	1 to 10 ev	nT	11.3 *3*		56W38
	0.77	nX	<0.1	sphere	56P45
	1.0	nX	0.2 *1*	sphere	56P45
	f spectrum	n, <0.7n'	0.21 *5*	sphere	57B54
	f spectrum	n, <1.4n'	0.712 *43*	sphere	57B54
	f spectrum	n, <5n'	2.21 *15*	sphere	57B54

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or $\int\sigma d\Omega$	Method	Ref.
Pb	2.5	nX	1.7 *3*	sphere	57S98
	2.5	nX	0.71 *6*	sphere	56B132
	7.0	nX	2.38 *15*	sphere	56B132
	2.5, 7.0	n, n'	table	sphere	56B132
	2.74	nT	7.318 *9*		57B50
	3.3	n, n(θ)	graph	scin n	56R47
	4.4	n, n(90°)	0.113 *25*	ppl	56W31
	4.4	n, 0.8 to 3.9n'(90°)	0.064 *18*	ppl	56W31
	14	n, n(θ)	graph	scin n	56N23
	~120	n, f	0.020		55R58
	~120	nA	1.50 *16*		56G63
	~380	nA	1.50 *16*		56G63
	~380	n, f	0.033		55G69
Bi^{209}	~25 kev	n, γ	0.0015 *5*	5.0^{d}Bi	57B105
	0.5	n, n(θ)	graph	recoil p	56A42
	1.0	nX	<0.1	sphere	56P45
	f spectrum	n, <0.7n'	0.197 *35*	sphere	57B54
	f spectrum	n, <1.4n'	0.728 *45*	sphere	57B54
	f spectrum	n, <5n'	2.35 *16*	sphere	57B54
	1.77 to 7.0	n, n'	table	sphere	56B132
	1.77	nX	0.40 *4*	sphere	56B132
	2.5	nX	0.75 *6*	sphere	56B132
	7.0	nX	2.38 *14*	sphere	56B132
	2.5, 7.0	n, n(θ)	graph		56B132
	2.5	nX	0.7 *3*	sphere	57S98
	2.74	nT	7.49 *1*		57B50
	3.3	n, n(θ)	graph	scin n	56R47
	4.4	n, n(82°)	0.185 *40*	ppl	56W36
	4.4	n, 3.5n'(82°)	0.020 *10*	ppl	56W36
	4.4	n, 1.9 to 3.5n'(82°)	0.135 *45*	ppl	56W36
	8	nX	2.59 *5*	sphere	57B02
	11	nX	2.64 *7*	sphere	57B02
	14	n, n'	0.17 *3*	ppl	57R58
	14	n, 2n	2.3 *3*	ppl	57R58
	~120	n, f	0.036		55G69
	~380	n, f	0.074		55G69
Ra^{226}	0.022 to 50ev	nT	graph		56P44
Th^{232}	th	nA	7.55 *25*		57W09
	20 to 400ev	nT	graph		57R06
	~25 kev	n, γ	0.30 *10*	27^{d}Pa	57M16
	~120	n, f	1		55D49
	~380	n, f	0.9		55G69
Th^{233}	th	n, f	≤20	ic	57F07
U	0.3	nX	0.4 *1*	sphere	56P45
	0.77	nX	0.9 *3*	sphere	56P45
	1.0	nX	1.6 *5*	sphere	56P45
	1.0, 2.5	n, n'	table	sphere	56B132

460722 O - 58 - 10

Neutron Cross Sections continued

Target	Neutron Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
U	1.0	nX	1.80 *25*	sphere	56B132
	2.5	nX	3.20 *30*	sphere	56B132
	~120	nA	1.68 *17*		56G63
	~380	nA	1.56 *18*		56G63
U^{233}	0.001 to 11ev	nT	graphs		56P31
	0.0253ev	nT	590 *15*		56P31
	0.100ev	nT	305 *4*		56P31
	th	nA	578 *17*	osc	57G48
	3.4 to 152kev	n,f(rel)	table		55L60
U^{235}	0.0253ev	n,f	556	cryst	56F20
	0.0253ev	n,f	614 *5*		57B107
	6 to 2000ev	n,f	graph		56Y03
	0.4 to 1.6	n,f	table		57D32
	1.27 *4*	n,f	1.27 *4*		57D32
	0.5	n,n(θ)	graph	recoil p	56A42
	1.0	n,n(θ)	graph	recoil p	56A42
	1.0, 2.5	n,n′	table	sphere	56B132
	1.0	nX	2.70 *30*	sphere	56B132
	2.5	nX	3.25 *30*	sphere	56B132
	~120	n,f	1.5		55G69
	~380	n,f	1.24		55G69
U^{238}	3 to 300ev	nT	graph		57B109
	20 to 400ev	nT	graph		57R06
	21 to 101ev	nT	table		56F28
	~25 kev	n,γ	0.61 *6*	$2.3^{d}Np$	57M16
	0.150	nX	0.63 *20*	sphere	57A34
	0.250	nX	0.63 *15*	sphere	57A34
	0.500	nX	0.80 *15*	sphere	57A34
	0.5	n,n(θ)	graph	recoil p	56A42
	1.0	n,n(θ)	graph	recoil p	56A42
	f spectrum	n,f	0.307 *5*		57L21
	~120	n,f	1.14		55G69
	~380	n,f	1.03		55G69
U^{239}	th	n,f	≤20		57F07
Np^{237}	0.02 to 2.8ev	nT	graph	cryst	57S79
	th	nA	170 *22*	cryst	57S79
Pu^{238}	th	n,γ	403 *8*	{ms; α-activity}	57B138
	$\int_{0.5ev}^{\infty}\sigma_{n,\gamma}dE/E$		3260 *280*	{ms; α-activity}	57B138
Pu^{239}	0.5	n,n(θ)	graph	recoil p	56A42
	1.0	n,n(θ)	graph	recoil p	56A42
Pu^{240}	0.075 ev	n,f	0.97 *110*	cryst	56L19
	0.10 ev	n,f	0.68 *93*	cryst	56L19
Pu^{242}	th	n,γ	18.6 *8*	{ms; α-activity}	57B138
	$\int_{0.5ev}^{\infty}\sigma_{n,\gamma}dE/E$		1275 *30*	{ms; α-activity}	57B138
Am^{243}	th	n,γ	73.6 *18*	ms; α-	57B138
	$\int_{0.5ev}^{\infty}\sigma_{n,\gamma}dE/E$		2290 *50*	activity	57B138

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3. GROUND STATE Q'S

Q values are defined by the conservation equation, $M_1 + M_2 = M_3 + M_4 + Q$ or $Q = E_3 + E_4 - E_1 - E_2$ where the M's are the rest masses and the E's the kinetic energies of the reacting particles. Ground state Q's are those measured when the product particles are left in their lowest energy states. If the most energetic emitted particle has escaped detection, the true ground state Q is greater than the value given.

The energy standard used, when clearly stated by the experimenter, is mentioned with the reference. Usually the energy measurement for only one particle, either the incident or emitted light particle, presents difficulties. It is the standard used for this particle that is given. The particle detected experimentally is placed inside the reaction parentheses. For example in the reaction written "$H^2(d,He^3)n$", He^3 and not n was the detected particle.

N. B. A uniform policy for denoting the use of enriched or monoisotopic material is now in use in all six New Nuclear Data tables. This policy is described in the section on Conventions just following the introduction. Briefly, parentheses around the A value indicate natural material, no parentheses enriched or monoisotopic material.

ABBREVIATIONS

a	absorption
a + scin	absorption followed by pulse height measurement in a scintillation counter
BF_3	boron trifluoride neutron counter
CcW	Cockcroft Walton accelerator
Cp	Compton electron
cyc	cyclotron
EA	electrostatic analyzer
ppl	photoplates or emulsions
s	magnetic spectrometer
scin	scintillation counter
sd	double focusing spectrometer
sπ pr	180° pair spectrometer
thresh n	detection of neutron threshold by measuring the ratio of slow to fast neutrons as a function of bombarding energy
VdG	Van de Graaff accelerator

Reaction	Value		Source	Detector	Ref.
$H^2(d,He^3)n$	3.271	*11*	VdG	EA	56D41
$H^2(d,H^3)p$	4.044	*5*	VdG	EA	56D41
$H^3(d,\alpha)n$	17.580	*25*	VdG	ppl	57M07
$Li^6(t,\alpha)He^5$	15.15	*4*	250-kev accelerator	pc	56C47
$Li^{(7)}(Li^7,p)B^{(13)}$	5.97	*5*	VdG	a + scin	57N14
$Be^9(Li^7,p)C^{15}$	9.05	*5*	VdG	a + scin	57N14
$B^{(10)}(d,t)B^{(9)}$	−2.187	*10*	VdG	s	56B118
$B^{10}(\alpha,d)C^{12}$	1.341	*1*	VdG	EA	56D41
$B^{10}(\alpha,p)C^{13}$	4.10	*3*	Po α	ppl	56P34
$B^{(11)}(d,\alpha)Be^{(9)}$	8.015	*10*	VdG	s	56B118
$B^{(11)}(d,p)B^{(12)}$	1.10	*2*		s	55K35
$C^{(12)}(d,\alpha)B^{10}$	−1.39	*2*	cyc	ppl	57E12
$C^{(12)}(He^3,n)O^{(14)}$	−1.1585	*30*	VdG	thresh n	57B118
$C^{14}(d,\alpha)B^{12}$	0.3620	*15*	VdG	EA	56D41
$C^{14}(d,p)C^{15}$	−1.007	*1*	VdG	EA	56D41
$C^{14}(\alpha,n)O^{17}$	−1.820	*2*	VdG	thresh n	56S106
$C^{14}(p,n)N^{14}$	−0.6264	*5*	VdG	thresh n	56S106

Reaction	Value		Source	Detector	Ref.
$N^{(14)}(d,n)O^{(15)}$	5.13	*5*	VdG	ppl	57N16
$N^{(15)}(p,n)O^{(15)}$	−3.5418	*14*	VdG	thresh n	57L33
$O^{(16)}(d,p)O^{(17)}$	1.885	*15*		s	55K35
$O^{18}(d,p)O^{19}$	1.734	*5*	VdG	s	57A19
$F^{19}(p,\alpha)O^{16}$	8.110	*10*	VdG	s	56S95
$F^{19}(n,d)O^{18}$	−5.79	*8*	(d,t)	scin	57R40
$F^{19}(d,t)F^{18}$	−4.17	*2*	cyc	ppl	57E12
$F^{19}(t,p)F^{21}$	6.200	*25*	VdG	sd	56J31
$F^{19}(\alpha,n)Na^{22}$	−1.950	*15*		BF_3	57W25
$Na^{23}(p,\alpha)Ne^{20}$	2.370	*8*	VdG	s	57B136
$Mg^{(24)}(d,p)Mg^{(25)}$	5.022	*45*		s	55K35
$Mg^{26}(\alpha,p)Al^{29}$	−2.90	*4*	cyc	a	57G47
$Al^{27}(p,\alpha)Mg^{24}$	1.596	*6*	VdG	sd	57V03
$Al^{27}(d,p)Al^{28}$	5.475	*25*		s	55K35
$Si^{(28)}(d,p)Si^{29}$	6.229	*40*		s	55K35

Reaction	Value		Source	Detector	Ref.
$P^{31}(p,\alpha)Si^{28}$	1.909	10	VdG	s	57E23
$P^{31}(p,n)S^{31}$	−6.06	20	cyc	ppl	56R50
$S^{(32)}(d,p)S^{(33)}$	6.408	20	VdG	s	56L43
$S^{(32)}(d,\alpha)P^{(30)}$	4.887	8	VdG	s	57P03
$S^{(32)}(d,\alpha)P^{(30)}$	4.831	13	VdG	s	56L43
$S^{(32)}(d,p)S^{(33)}$	6.633	20		s	56K44
$S^{(32)}(d,p)S^{(33)}$	6.413	6	VdG	s	57P03
$S^{(32)}(p,\gamma)Cl^{(33)}$	2.285	12	CcW	scin	56V23
$S^{34}(d,\alpha)P^{32}$	5.04	2	VdG	s	56L43
$Cl^{(35)}(p,\alpha)S^{(32)}$	1.860	5	VdG	sd	57V03
$Cl^{(35)}(p,\gamma)A^{(36)}$	8.40	15	VdG	scin	57T21
$Cl^{(37)}(p,\alpha)S^{(34)}$	3.028	6	VdG	sd	57V03
$Cl^{(37)}(p,\gamma)A^{(38)}$	10.15	15	VdG	scin	57T21
$K^{(39)}(p,\gamma)Ca^{(40)}$	8.17	3	CcW	$s\pi$ pr	57D18
$K^{(39)}(p,\gamma)Ca^{(40)}$	8.35	15	VdG	scin	57T21
$Ca^{(40)}(d,p)Ca^{(41)}$	6.140	9	VdG	s	56B102
$Ca^{42}(d,p)Ca^{43}$	5.711	10	VdG	s	57B99
$Ti^{(47)}(n,\gamma,\gamma)Ti^{(48)}$	11.61	2	pile	$s\pi$ pr	57M09
$Ti^{(48)}(n,\gamma,\gamma)Ti^{(49)}$	8.153	10	pile	$s\pi$ Cp	56A37
$Ti^{(48)}(n,\gamma,\gamma)Ti^{(49)}$	8.132	6	pile	$s\pi$ pr	57M09
$Ti^{(49)}(n,\gamma,\gamma)Ti^{(50)}$	10.96	6	pile	$s\pi$ pr	57M09
$Co^{59}(p,\alpha)Fe^{56}$	3.242	8	VdG	s	57M03
$Co^{59}(p,n)Ni^{59}$	−1.856	4	VdG	thresh n	57B137
$Co^{59}(p,n)Ni^{59}$	−1.863	5	VdG	thresh n	57C30
$Ni^{60}(p,\gamma)Cu^{61}$	4.81	3	VdG	scin	57G26
$Ni^{61}(p,\gamma)Cu^{62}$	6.03	6	VdG	scin	57G26
$Ni^{62}(p,\gamma)Cu^{63}$	6.13	3	VdG	scin	57G26
$Ni^{64}(p,\gamma)Cu^{65}$	7.42	3	VdG	scin	57G26
$Cu^{63}(p,\gamma)Zn^{64}$	7.69	4	VdG	scin	57G26
$Cu^{65}(p,n)Zn^{65}$	−2.1322	15	VdG	thresh n	56M71
$Cu^{65}(p,\gamma)Zn^{66}$	8.85	4	VdG	scin	57G26
$Zn^{67}(p,n)Ga^{67}$	−1.778	5	VdG	thresh n	57C30
$Zn^{68}(p,n)Ga^{68}$	−3.707	5	VdG	thresh n	57C30
$Zn^{70}(p,n)Ga^{70}$	−1.435	5	VdG	thresh n	57B145
$As^{75}(p,n)Se^{75}$	−1.648	4	VdG	thresh n	57B145
$Se^{(77)}(p,n)Br^{(77)}$	−2.147	4		thresh n	57J14
$Kr^{78}(d,p)Kr^{79}$	5.98	5	cyc	ppl	56B110
$Kr^{80}(d,p)Kr^{81}$	5.63?	10	cyc	ppl	56B110
$Rb^{(85)}(\gamma,n)Rb^{(84)}$	−10.50	7	βtron	BF_3	56T20
$Rb^{(87)}(\gamma,n)Rb^{(86)}$	−9.60	5	βtron	BF_3	56T20
$Sr^{86}(\gamma,n)$	−10.5 to −12		βtron	BF_3	56Y04
$Mo^{95}(p,n)Tc^{95}$	−2.44	3	VdG	thresh n	57L23
$Hf^{(177)}(\gamma,n)Hf^{(176)}$	−6.70	9	βtron	BF_3	56T20
$Hf^{(179)}(\gamma,n)Hf^{(178)}$	−6.52	12	βtron	BF_3	56T20

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4. MASS DIFFERENCES AND RATIOS

Where no superscripts have been used with H, C, and O, the weights of the most abundant isotopes, namely 1, 12, and 16 respectively, are to be understood. Differences are given in millimass units.

	Value		Ref.
$CH_4 - O$	36.3961	5	57Q01
$C_4H_4O - 2H_2O_2$	15.2624	16	57Q01
$C^{13}C_9H_{14} - Ba^{135}$	207.40	10	57J18
$C^{13}C_9H_{16} - Ba^{137}$	223.08	6	57J18
$C^{13}C_9H_{18} - La^{139}$	238.23	6	57J18
$C^{13}C_{10}H_{10} - Nd^{143}$	172.08	10	57J18
$C_2^{13}C_8H_7F^{19} - Nd^{148}$	143.46	6	57J18
$C^{13}C_9H_7F^{19} - Sn^{147}$	142.09	3	57J18
$C^{13}C_{12}H_{12} - Eu^{153}O$	181.8	4	57J18
$F^{19}C_{10}H_5 - Nd^{144}$	127.77	7	57J18
$F^{19}C_{10}H_6 - Nd^{145}$	133.33	19	57J18
$F^{19}C_{10}H_7 - Nd^{146}$	140.53	6	57J18
$F^{19}C_2^{13}C_8H_7 - Nd^{148}$	143.46	6	57J18
$F^{19}C_{10}H_5 - Sn^{144}$	125.92	9	57J18
$F^{19}C^{13}C_9H_7 - Sn^{147}$	142.09	3	57J18
$S^{32} - O_2$	-17.7612	9	57Q01
$S^{32}O_2 - Ni^{64}$	33.901	5	56Q03
$S^{32}O_2 - Zn^{64}$	32.7687	32	56Q03
$Fe^{54} - C_4H_6$	-107.374	4	56Q03
$Fe^{56} - C_4H_8$	-127.698	4	56Q03
$Fe^{57} - C_4H_9$	-135.055	7	56Q03
$Fe^{58} - C_4H_{10}$	-144.977	4	56Q03
$Co^{59} - C_2H_3O_2$	-80.1466	23	56Q03
$Ni^{58} - C_4H_{10}$	-142.941	7	56Q03
$Ni^{60} - C_2H_4O_2$	-90.387	6	56Q03
$Ni^{61} - C_2H_5O_2$	-97.894	5	56Q03
$Ni^{62} - C_5H_2$	-87.339	6	56Q03
$Ni^{64} - S^{32}O_2$	-33.901	5	56Q03
$Cu^{63} - C_5H_3$	-93.909	7	56Q03
$Cu^{65} - C_5H_5$	-111.377	4	56Q03
$Zn^{64} - S^{32}O_2$	-32.7687	32	56Q03
$Zn^{64} - 2O_2$	-50.5266	52	56Q03
$Zn^{66} - C_5H_6$	-120.935	6	56Q03
$Zn^{67} - C_5H_7$	-127.675	7	56Q03
$Zn^{68} - C_5H_8$	-137.781	4	56Q03
$Zn^{70} - C_5H_{10}$	-152.953	6	56Q03
$Xe^{130} - C_6H_{10}O_3$	-159.53	3	57J18
$Xe^{131} - C_{10}H_{11}$	-181.05	4	57J18
$Xe^{131} - Xe^{130}$	1001.87		57J18
$Xe^{132} - C_{10}H_{12}$	-189.79	5	57J18
$Xe^{132} - Xe^{131}$	999.42		57J18
$Xe^{132} - Cs^{133}$	-1001.32		57J18
$Xe^{134} - C_{10}H_{14}$	-204.20	5	57J18
$Xe^{134} - Cs^{133}$	1000.53		57J18
$Xe^{136} - C_{10}H_{16}$	-218.055	25	57J18
$Cs^{133} - C_{10}H_{13}$	-196.66	7	57J18
$Cs^{133} - Xe^{132}$	1001.32		57J18
$Cs^{133} - Xe^{134}$	-1000.53		57J18
$Ba^{130} - C_6H_{10}O_3$	-156.24	20	57J18
$Ba^{132} - C_{10}H_{12}$	-188.84	12	57J18
$Ba^{134} - C_{10}H_{14}$	-205.36	8	57J18
$Ba^{135} - C^{13}C_9H_{14}$	-207.40	10	57J18
$Ba^{135} - Ba^{134}$	1001.54		57J18
$Ba^{136} - C_{10}H_{16}$	-220.89	9	57J18
$Ba^{136} - Ba^{135}$	999.19		57J18
$Ba^{137} - C^{13}C_9H_{16}$	-223.08	6	57J18
$Ba^{137} - Ba^{136}$	1001.57		57J18
$Ba^{138} - C_{10}H_{18}$	-236.03	8	57J18
$Ba^{138} - Ba^{137}$	999.75		57J18
$La^{138} - C_{10}H_{18}$	-234.17	20	57J18
$La^{139} - C^{13}C_9H_{18}$	-238.23	6	57J18
$Ce^{136} - C_{10}H_{16}$	-218.19	20	57J18
$Ce^{138} - C_{10}H_{18}$	-234.89	20	57J18
$Ce^{140} - C_{10}H_{20}$	-251.29	6	57J18
$Ce^{142} - C_{10}H_{22}$	-262.93	7	57J18
$Pr^{141} - C_{11}H_9$	-163.00	3	57J18
$Nd^{142} - C_{10}H_{22}$	-264.74	3	57J18
$Nd^{143} - C^{13}C_{10}H_{10}$	-172.08	10	57J18
$Nd^{143} - Nd^{142}$	1002.43		57J18

	Value		Ref.
$Nd^{144} - C_{10}H_5F^{19}$	−127.77	7	57J18
$Nd^{144} - Nd^{143}$	1000.56		57J18
$Nd^{145} - C_{10}H_6F^{19}$	−133.33	19	57J18
$Nd^{145} - Nd^{144}$	1002.78		57J18
$Nd^{146} - C_{10}H_7F^{19}$	−140.53	6	57J18
$Nd^{146} - Nd^{145}$	1000.82		57J18
$Nd^{148} - C_2^{13}C_8H_7F^{19}$	−143.46	6	57J18
$Nd^{150} - C_9H_{10}O_2$	−147.30	7	57J18
$Sm^{144} - C_{10}H_5F^{19}$	−125.92	9	57J18
$Sm^{147} - C^{13}C_9H_7F^{19}$	−142.09	3	57J18
$Sm^{148} - Sm^{147}$	1000.25		57J18
$Sm^{149} - Sm^{148}$	1002.71		57J18
$Sm^{150} - C_9H_{10}O_2$	−151.23	7	57J18
$Sm^{150} - Sm^{149}$	1000.42		57J18
$Sm^{152} - C_{12}H_8$	−143.29	13	57J18
$Sm^{154} - C_{12}H_{10}$	−156.37	15	57J18
$Eu^{151} - C_{12}H_7$	−135.26	17	57J18
$Eu^{151}_0 - C_{13}H_{11}$	−171.69	19	57J18
$Eu^{153}_0 - C^{13}C_{12}H_{12}$	−181.8	4	57J18

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5. NUCLEAR SPINS AND MOMENTS

Listed here in tabular form are the nuclear spins and moments which are also reported, often in a more detailed manner, in Table 1. Spins, J, are given in units of $h/2\pi$; magnetic dipole moments, μ, in nuclear magnetons; electric quadrupole moments, q, in barns; magnetic octupole moments, μ_3, in nuclear magneton barns; electric 16-pole moments, q_4, in 10^{-48} cm^4.

Magnetic moments are reported without diamagnetic correction and, where relative measurements have been made, are based on $\mu(H) = +2.79267$ and the substandards listed by H. Walchli, ORNL-1469. The spins and moments are those for the ground states of nuclei unless a particular level is specified. When the sign of the moment cannot be determined by the experimental method used, measured values are given between absolute value signs, e.g. $|1.1774\ 2|$.

ABBREVIATIONS

calc	value obtained from reevaluation of old data
d res	double resonance
$\gamma(\theta,T)$	γ intensity as function of angle and temperature
$\gamma\gamma(\theta,H)$	$\gamma\gamma$ coincidences as a function of angle and magnetic field strength
I	nuclear induction, magnetic resonance
M	molecular or atomic beam resonance
Mic	microwave
para	paramagnetic resonance
$p\gamma(\theta,H)$	$p\gamma$ coincidences as a function of angle and magnetic field strength
q res	quadrupole resonance
S	atomic spectrum

	J	μ	q	Method	Ref.
n^1		$-1.913148\ 66$		M	56C57
H^1		$+2.79273\ 4$		electron-cyclotron	56F30
He^3		negative		I	57K31
O^{17}			$-0.026\ 9$	Mic	57S93
F^{19}		$+2.6117$		I	56S111
Ne^{21}	3/2			M	56H70
Cl^{35}		$\mu_3 = -0.0188\ 3$		calc M	57S28
Cl^{37}		$\mu_3 = -0.0146\ 3$		calc M	57S28
K^{39}			$+0.07\ 2$	M	56B119
		$+0.40\ 2$	$+0.11\ 2$	d res	57R37
V^{49}	7/2	$\|4.46\ 5\|$		para	57W17
Cr^{53}	3/2			para	56M98
Mn^{52}		$+2.8\ ^{+8}_{-5}$		$\gamma(\theta,T)$; see ref.	57H80
Mn^{53}	7/2	$\|5.050\ 7\|$		para	56D45

	J	μ	q	Method	Ref.
Cu^{61}	3/2			M	57N09
Cu^{63}		$+2.226\ 7$		q res	57C48
Cu^{65}		$+2.376\ 7$		q res	57C48
Zn^{67}			$+0.18\ 2$	d res	57B110
Ga^{66}	0?	$<10^{-3}$		M	57H86
Ga^{67}	3/2			M	57H86
Ga^{69}		$\mu_3 = 0.137\ 5$		calc M	57S28
Ga^{71}		$\mu^{71}/\mu^{69} = 1.2700\ 8$		S	56J29
		$\mu_3 = 0.180\ 5$		calc M	57S28
As^{76}	2	$-0.906\ 4$		$\gamma(\theta,H)$; d res	57P28
	2			M	57C38
Zr^{91}	5/2	$-1.29805\ 2$		I	57B126
Tc^{99} (0.181 level)		$g = +1.5\ 2$		$\gamma\gamma(\theta,H)$	57R02
Ag^{105}	1/2			M	56S100
Ag^{111}	1/2	$-0.1450\ 15$		M	56W27
Cd^{111}	(0.247 level)		~2	$\gamma\gamma(\theta,T)$	57S102

	J	μ	q	Method	Ref.
In^{113}	(0.392 level)				
	1/2	+0.2098 *4*		M	56C52
		or −0.2105 *4*			
In^{113}		μ_3 = 0.574 *15*		M	57E07
In^{115}		μ^{115}/μ^{113} = 1.0021437 *12*		I	57R42
		μ_3 = 0.565 *12*		M	57E07
I^{125}	5/2	+3.0 *10*	−0.66	Mic	57F13
I^{127}		μ_3 = 0.181 *47*		calc M	57S28
			−0.59	Mic	57F13
I^{129}			−0.43	Mic	57F13
I^{131}	7/2	+2.56 *13*	−0.29	Mic	57F13
Cs^{127}	1/2			M	56N16
		(+?)1.43 *2*		M	57S56
Cs^{129}	1/2			M	56N14
		(+?)1.47 *2*		M	57S56
Cs^{130}	1			M	56N16
Cs^{131}	5/2			M	56N14
Cs^{132}	2			M	56N14
Cs^{133}			−0.0033 *39*	M	56B119
Cs^{134}		+2.9729 *9*		M	57S111
Cs^{135}		+2.7134 *3*		M	57S111
Cs^{137}		+2.8219 *3*		M	57S111
La^{139}			+0.3 *1*	S	57M96
Nd^{147}		|≥0.44 *6*|		γ(θ,T)	57B86
Sm^{152}	(0.122 level)				
		|0.72 *1*|		pγ(θ,H)	57S16
Eu^{151}		$\|\mu^{151}/\mu^{152}\|$ = 1.77 *2*		para	57M19
		μ^{151}/μ^{153} = +2.24 *3*		para	56M99
Eu^{152}	3	|2.03|		para	57M19
Eu^{154}	3	$\|\mu^{154}/\mu^{153}\|$ = 1.308 *4*		para	56K35
Gd^{155}	3/2	|0.24 *4*|		para	56L29
Gd^{157}	3/2	|0.32 *5*|		para	56L29
Yb^{173}			+2.4	S	56K42
Lu^{175}			+3.6 *2*	S	57M96
	7/2	+2.0 *2*	+5.6 *5*	S	57S94
Lu^{176}	6(5,7?)	+2.8 *3*	+8.0 *7*	S	57S94
Ta^{181}	(0.482 level)				
	5/2	+3.25 *17*		γγ(θ), γγ(θ,H)	56D43
		+3.08 *12*		γγ(θ,H)	57K54
Ta^{181}			+2.7 *3*	S	57M96
Re^{185}		q^{185}/q^{187} = 1.056 *5*		q res	57S32
Os^{189}			+0.60 *14*	S	57M96
Hg^{199}		+0.532		S	57B100
Hg^{201}		μ^{201}/μ^{199} = 1.110 *1*	+0.50 *5*	S	57B100
Tl^{197}	1/2			M	57B132
Tl^{198}	(1.9^h level)				
	7			M	57B132
Tl^{199}	1/2			M	57B132
Tl^{204}	2	|0.0894 *20*|		M	57B132
	2	|0.062 *6*|		M	56B124
Po^{212}	≠0			βα(θ)	ppl 56B138
U^{233}	5/2		+13 *5*	S	56Z05
	5/2	|0.54|*	|3.5|*	para	57D40
		or |0.48|§	or |3.3|§	*,§ see ref	57D40
U^{235}			(−?) 3.8	para	56B129
	7/2	μ^{233}/μ^{235} = −1.6 *1*		S	56K53
		q^{233}/q^{235} = +0.8 *3*		S	56K53

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6. ELASTIC AND INELASTIC SCATTERING OF CHARGED PARTICLES

The following tables present summaries of data on elastic and inelastic scattering of charged particles—protons, deuterons, tritons, alpha-particles, and He^3 nuclei. The literature coverage is for the period from January 1950 to July 1957.

I. Individual Experiments
   A. Elastic Scattering
   B. Inelastic Scattering
II. Related Data
   A. Elastic Scattering
   B. Inelastic Scattering
III. Analysis

The criterion for the selection of data is that the investigation be primarily of a reaction mechanism rather than of the properties of a specific nuclear level, since in the latter case, reference can be found in Table 1 of this cumulation and in previous cumulations appearing in issues No. 24B of Nuclear Science Abstracts. Hence, the data of interest are for the most part angular distributions for elastic and inelastic scattering and energy distributions for inelastic scattering. In certain cases excitation curves and measurements of polarization have also been noted. The upper limit for the bombarding energy has been arbitrarily set at approximately 100 Mev. Only data which have appeared in published articles have been included; those from reports and abstracts have been omitted. All subscripts denote energy lost in the inelastic scattering process.

This tabulation attempts to collect all scattering data since 1950 so that together with future compilations, a complete survey will be readily possible for any phase of charged particle scattering. Succeeding tabulations will be on a semi-annual basis, appearing in issue 12B of Nuclear Science Abstracts and in the NSA Annual Nuclear Data Cumulation. The annual cumulation will include the data previously listed in NSA 12B.

Since it has been necessary to survey a large amount of the literature, it is likely that some experiments have been overlooked. Those persons who locate such oversights are requested to write the Nuclear Data Group so that the tabulation may be made complete.

A few remarks are in order concerning the various categories of listings:

I. Individual Experiments. These data are arranged first according to the mass number of the target and then according to increasing bombarding energy without regard to the type of bombarding particle.

II. Related Data. This section concerns experiments of a given type on several different target elements about which common comments are necessary; i.e., analysis is made of the entire set of data rather than on the individual experiments.

III. Analysis. In this section references are arranged chronologically.

ABBREVIATIONS

A	mass number	pc	proportional counter
CcW	Cockcroft Walton accelerator	ppl	photoplates or emulsions
c.m.	center of mass	R	nuclear radius in fermis (10^{-13} cm)
cyc	cyclotron	s	magnetic spectrometer
$\delta^0, \delta^1, \ldots$	S-wave, P-wave, ... phase-shift	scin	scintillation counter
ic	ionization chamber	σ_R	Rutherford cross section
k	wave number	T	isotopic spin
lin	linear accelerator	VdG	Van de Graaff accelerator
P	polarization		

I. INDIVIDUAL EXPERIMENTS

I.A. ELASTIC SCATTERING

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
H(p,p)	0.35 to 0.42	$\sigma(45°)$	VdG, pc	54C67	Interference minimum occurs at $E_p = 0.3828 \pm 0.0015$ Mev.
H(t,t)	0.4 to 2.5	t,t(θ)	CcW, ppl	57B15	Total cross section for $0.5 < E_p < 3.5$ also given.
H(d,d)	0.96 to 3.22	d,d(θ)	VdG, pc	52B88	Minimum near θ(c.m.) = 90° at all energies.
H(p,p)	1.8 to 4.2	p,p(θ)	VdG, pc	53W59	Departures from pure S-wave scattering observed at all energies.
H(α,α)	3.1 to 5.3	σ(E) 1θ	Po α, ppl	54R23	No resonances found; deviations from Coulomb scattering.
H(p,p)	3.4 to 7.5	p,p(θ)	cyc, ppl	51R29	S-wave scattering only.
H(p,p)	4.96	p,p(θ)	cyc, ppl	50M95	
H(p,p)	5.1	p,p(θ)	cyc, ppl	51M73	$\delta^0 = 54.5 \pm 0.6°$; $\delta^1 = 0.05 \pm 0.09°$.
H(p,p)	5.14	p,p(θ)	cyc, pc	52B87	δ^0(for θ(c.m.) = 90°) = $53.89 \pm 0.63°$; $\delta^1 = 0 \pm 1.5°$.
H(p,p)	5.77	p,p(θ)	cyc, ppl, pc	54Z01	$\delta^0 = 55.29 \pm 0.30°$, $\delta^1 = -0.08 \pm 0.07°$.
H(p,p)	9.7	p,p(θ)	cyc, ppl	52A35	$\delta^0 = 57.8 \pm 1.2°$; $\delta^1 \sim 0°$.
H(p,p)	9.7	p,p(θ)	lin, pc + scin	54C68	Data consistent with pure S-wave scattering.
H(d,d)	9.94	d,d(θ)	cyc, ppl	50R70	
H(d,d)	10.0	d,d(θ)	cyc, pc	51K48	Fair agreement with theory of Buckingham and Massey.
H(d,d)	10.2	d,d(θ)	cyc, ppl	52M65	
H(d,d)	10.4	d,d(θ)	cyc, ppl	51R30	S-, P-, and D-waves present.
H(p,p)	12.4	$\sigma(45°)$	cyc, ppl	50F83	$\delta^0 = 52° 20'$.
H(He^3,He^3)	14.9	He^3,He^3(θ)	cyc, ppl	55S47	Center of mass energy = 3.72Mev. Pronounced increase in backward direction contrary to theoretical predictions.
H(p,p)	18.2	p,p(θ)	cyc, scin	54Y04	$\delta^0 = 54.1°$, $\delta^1 = 1.0°$, $\delta^2 = 0.4°$.
H(p,p)	18.8 to 31.8	$\sigma(90°)$	cyc, pc	50C82	
H(p,p)	29.4	p,p(θ)	cyc, ppl	50P79	Apparently only S-waves present; $\delta^0 \sim 50°$.
H(p,p)	30.1	p,p(θ)	cyc, ppl	51F30	
H(p,p)	31.8	p,p(θ)	cyc, pc	50C81	Apparently only S-waves present; $\delta^0 \sim 50°$.
H(p,p)	40 to 95	σ(E) 1θ	cyc, scin	56K13	
H(p,p)	45 to 90	p,p(θ)	cyc, scin	54K48	
H(p,p)	70, 95	$\sigma(\theta)$ 6θ's	cyc, scin	56K13	
H(p,p)	75, 105	p,p(θ)	cyc, scin	51B91	Isotropic distribution from θ(c.m.) = 40° to 90°.
H(p,p)	100	p,p(θ)	cyc, scin	50B97	Isotropic distribution from θ(c.m.) = 40° to 90°.
H^2(p,p)	5.1	p,p(θ)	cyc, ppl	52M65	
H^2(d,d)	7.94	d,d(θ)	cyc, ppl	51B95	
H^2(p,p)	9.7	p,p(θ)	cyc, ppl	52A35	Agreement with theory of Christian and Gammel; some evidence for the H^2(p,pn)H^1 reaction.

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
$H^2(d,d)$	10.5	$d,d(\theta)$	cyc, ppl	52R46	
$H^2(p,p)$	20.6	$p,p(\theta)$	cyc, pc	55C58	Minima near θ(c.m.) = 130° and 18°, the latter due to nuclear-Coulomb interference.
$H^3(d,d)$	0.96 to 3.22	$d,d(\theta)$	VdG, pc	52S68	Minimum near θ(c.m.) = 90°, moving to larger angles with increasing deuteron energy.
$H^3(p,p)$	1.0 to 2.5	$p,p(\theta)$	VdG, pc	54E29	
$H^3(t,t)$	1.6 to 2.0	$t,t(\theta)$	VdG, pc	56H12	
$H^3(p,p)$	2.54 to 3.50	$p,p(\theta)$	VdG, pc	51C28	Strong minimum near θ(c.m.) = 100°.
$H^3(d,d)$	10.2	$d,d(\theta)$	cyc, ppl	52A36	
$He^3(d,d)$	1.0 to 3.25	$d,d(\theta)$	VdG, pc	54B105	Minima near θ(c.m.) = 90°.
$He^3(p,p)$	9.75	$p,p(\theta)$	lin, scin	56L33	Agreement with a theoretical curve is not found.
$He^3(d,d)$	10.2	$d,d(\theta)$	cyc, ppl	52A36	
He(α,α)	0.15 to 3.0	$\alpha,\alpha(\theta)$, σ(E)	VdG, pc	56H57	Nuclear S-wave interaction contributes for E > 0.4 Mev; a D-wave contribution is found for E > 2.5 Mev; phase shifts are given.
He(α,α)	3 to 6	$\alpha,\alpha(\theta)$, σ(E)	VdG, scin	56R41	S- and D-wave phase shifts are given graphically.
He(p,p)	5.1	$p,p(\theta)$	cyc, pc	51B93	
He(p,p)	5.78	$p,p(\theta)$	cyc, ppl	54K49	Phase shifts compared with those for other E_p.
He(p,p)	7.5	$p,p(\theta)$	cyc, ppl	56P41	S-, P-, and D-wave phase shifts are given.
He(p,p)	9.48	$p,p(\theta)$	cyc, ppl	52P33	
He(p,p)	9.55	$p,p(\theta)$	cyc, ppl	54F22	
He(p,p)	9.73	$p,p(\theta)$	lin, scin	54C69	
He(p,p)	9.76	$p,p(\theta)$	lin, ppl	55W50	Minimum near θ(c.m.) = 115°.
He(d,d)	10.3	$d,d(\theta)$	cyc, ppl	51A26	
He(α,α)	12.3 to 22.9	$\alpha,\alpha(\theta)$	cyc, ppl	56N20	
He(d,d)	13.7, 19.0	$d,d(\theta)$	cyc, ppl	54F22	
He(α,α)	12.9 to 21.6	$\alpha,\alpha(\theta)$	cyc, ppl	53S84	δ^4 appreciable for E_α > 18 Mev.
He(p,p)	17.45	$p,p(\theta)$	cyc, scin	56B29	Least-squares fitted phase shifts for S-, P-, D-, and F-waves are given.
He(p,p)	19.5	$\sigma(55°)$	lin, pc	53C62	$\sigma(55°)$ = 59.1 mb/sterad.
He(α,α)	20.0	$\alpha,\alpha(\theta)$	cyc, ppl	51M74	
He$(\alpha\ \alpha)$	20.4	$\sigma(60°,90°)$	cyc, pc	51B92	
He(α,α)	30	$\alpha,\alpha(\theta)$	cyc, pc	51G45	S-, D-, and G-waves present.
He(p,p)	31.6	$p,p(\theta)$	lin, pc	53C62	
He(α,α)	38.5	$\alpha,\alpha(\theta)$	cyc, ppl	57B13	δ^0 and δ^2 are large; δ^4, δ^6, δ^8 are small.
He(p,p)	39.8	$p,p(\theta)$	lin, scin	57B124	Forward minimum at θ(c.m.) = 9°.
He(p,p)	40	E(p') 1θ	lin, scin	56E05	
$Be^9(d,d)$	7.70	$d,d(\theta)$	cyc, ppl	52E01	Secondary maximum near θ(c.m.) = 65°, in agreement with a Born approximation calculation.

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
$Be^9(p,p)$	9.9	$p,p(\theta)$	lin, ppl	56R32	Diffraction pattern alone insufficient to explain data.
C(p,p)	2.0 to 2.75	$p,p(\theta)$	VdG, pc	50W81	P-waves present.
C(d,d)	7.86	$d,d(\theta)$	cyc, ppl	54C52	
C(p,p)	9.5	$p,p(\theta)$	cyc, ppl	53B90	
C(p,p)	9.94	$p,p(\theta)$	cyc, pc + range	54F39	
C(p,p)	14.7 to 19.4	$p,p(\theta)$	cyc, scin	57P14	
C(p,p)	19 to 26	σ(E) 1θ	lin, pc + scin	55K43	Maximum near $E_p = 22.5$ Mev.
C(d,d)	19.1	$d,d(\theta)$	cyc, ppl	54F24	
C(α,α)	20.4 to 22.6	σ(E) 1θ	cyc, ms	55R49	
C(p,p)	20.7 to 24.3	$p,p(\theta)$	lin, pc + scin	55K43	Secondary maxima near θ(c.m.) = 75°.
C(p,p)	96	$p,p(\theta)$	cyc, scin	56S65	
N(p,p)	9.45	$p,p(\theta)$	cyc, ppl	54F38	
N(p,p)	19.9	$p,p(\theta)$	cyc, scin	57C32	Maxima and minima correspond to diffraction scattering predictions.
O(p,p)	9.5	$p,p(\theta)$	cyc, ppl	53B90	
O(p,p)	15 to 21	σ(E) 4θ's	lin, pc + scin	55K43	Maximum near $E_p = 18.6$ Mev.
O(p,p)	19	$p,p(\theta)$	cyc, scin	55H70	
O(p,p)	20.3	$p,p(\theta)$	cyc, scin	57C32	Maxima and minima correspond to diffraction scattering predictions.
Ne(d,d)	7.8	$d,d(\theta)$	cyc, ppl	52M46	
Ne(p,p)	9.51	$p,p(\theta)$	cyc, ppl	54F37	
Mg(p,p)	7.9 to 9.5	$p,p(\theta)$	cyc, scin	57G45	Marked variation of angular distribution with energy.
Mg(p,p)	9.6	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	52B86	Large maximum near θ(c.m.) = 90°.
Mg(p,p)	9.83	$p,p(\theta)$	cyc, pc	56G53	
Mg(p,p)	9.94	$p,p(\theta)$	cyc, pc + range	54F39	
Mg(α,α)	42	$\alpha,\alpha(\theta)$	cyc	56G18	
$Al^{27}(\alpha,\alpha)$	18.9	$\sigma(\theta)/\sigma_R(\theta)$	cyc, scin	55B153	Pronounced diffraction pattern.
$Al^{27}(p,p)$	30.4	$\sigma(96°)$	cyc, ppl	50L68	$\sigma(96°) = 4.1$ mb/sterad.
$Al^{27}(\alpha,\alpha)$	40	$\alpha,\alpha(\theta)$	cyc, scin	55E19	Pronounced diffraction pattern.
A(p,p)	9.51	$p,p(\theta)$	cyc, ppl	54F37	
Ni(p,p)	5.25	$\sigma(\theta)/\sigma_R(\theta)$	cyc, ic	55B152	
Ni(p,p)	5.7	$p,p(\theta)$	cyc, ppl	57T05	
Ni(p,p)	18.7	$p,p(\theta)$	lin, scin	56V26	Results compared with optical-model predictions.

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
Cu(p, p)	5.25	$\sigma(\theta)/\sigma_R(\theta)$	cyc, ic	55B152	
Cu(p, p)	5.7	p, p(θ)	cyc, ppl	57T05	
Cu(p, p)	6.5	$\sigma(\theta)/\sigma_R(\theta)$	cyc, scin	53G37	Complex potential required to explain data.
Cu(p, p)	18.7	p, p(θ)	lin, scin	56V26	Results compared with optical-model predictions.
Cu(α, α)	18.9	$\sigma(\theta)/\sigma_R(\theta)$	cyc, scin	55B153	
Ag(α, α)	48.2	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	55E18	Sharp cut-off model reproduces only the region forward of θ(c.m.) = 25°.
Au(p, p)	6.5	$\sigma(\theta)/\sigma_R(\theta)$	cyc, scin	53G37	Pure Rutherford scattering to within 5 per cent.
Au(p, p)	7.8	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	55G70	Pure Rutherford scattering.
Au(d, d)	8.5 to 15.2	σ(E) 1θ	cyc, pc	55G70	σ(30°) varies as $1/E^2$ to within 6 per cent.
Au(α, α)	14 to 42	σ(E) 2θ's	cyc, pc + range	54F36	Strong deviations from Rutherford scattering occur for $E_\alpha > 27$ Mev ($\theta = 60°$) and 20 Mev ($\theta = 95°$), yielding an apsidal distance of 12.7×10^{-13} c.m.
Au(d, d)	15.2	σ(30°)	cyc, pc	55G70	Cross section equals Coulomb cross section to within 20 per cent.
Au(α, α)	27.5	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	55G70	
Au(p, p)	32	p, p(θ)	lin, ppl	57G12	Positions of maxima and minima agree approximately with elementary diffraction theory.
Au(α, α)	48.2	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	55E18	Sharp cut-off model reproduces only the region forward of θ(c.m.) = 25°.
Pb^{208}(d, d)	15.2	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	55G70	Rutherford scattering forward of θ(c.m.) = 35°; rapid fall-off for larger angles.
Bi^{209}(d, d)	15.2	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	55G70	Rutherford scattering forward of θ(c.m.) = 35°; rapid fall-off for larger angles.

I.B. INELASTIC SCATTERING

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
Li^6(α, α')	31.5	$\sigma(\alpha'_{3.57})$	cyc, scin	56W29	The cross section for the excitation of the T = 1 level at 3.57 Mev is < 4 per cent of that for the T = 0 levels.
Be^9(p, p')	7.1	p, $p'_{2.4}(\theta)$	cyc, ppl	52D29	Strong forward peak.
Be^9(d, d')	9	d, $d'_{2.43}(\theta)$	cyc, s	56G37	
Be^9(p, p')	9.9	p, $p'_{2.4}(\theta)$	lin, ppl	56R32	
Be^9(p, p')	31.3	p, p'(θ)	lin, pc + range	56B14	Data for 5 excited states; direct interaction curves are fitted and l-values and radii are given.
C^{12}(p, p')	7.3	p, $p'_{4.4}(\theta)$	cyc, scin	52G24	Asymmetric about θ(c.m.) = 90°; Legendre coeffs. given.
C^{12}(d, d')	7.86	d, $d'_{7.6}(\theta)$	cyc, ppl	56C65	

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
$C^{12}(d,d')$	9	$d,d'_{4.43}(\theta)$	cyc, s	56G37	
$C^{12}(p,p')$	9.5	$p,p'_{4.4}(\theta)$	cyc, ppl	53B90	Symmetric about θ(c.m.) = 90°.
$C^{12}(p,p')$	9.94	$p,p'_{4.4}(\theta)$	cyc, pc + range	54F39	Approximately symmetric about θ(c.m.) = 90°.
$C^{12}(p,p')$	14.7 to 19.4	$p,p'(\theta)$	cyc, scin	57P14	Data for levels at 4.4, 7.7, and 9.6 Mev; comparison is made with direct interaction theory.
$C^{12}(d,d')$	19.1	$d,d'(\theta)$	cyc, ppl	54F24	Angular distributions for levels at 4.43 and 9.61 Mev.
$C^{12}(\alpha,\alpha')$	20.5 to 22.6	σ(E) 1θ	cyc, ms	55R49	4.43-Mev level; maximum near 21.8 Mev.
C(p,p')	96	E(p') 1θ	cyc, scin	54S108	
$C^{12}(p,p')$	96	E(p') 7θ's	cyc, scin	56S65	
$C^{12}(p,p')$	96	$p,p'_{4.43}(\theta)$	cyc, scin	56S65	The excitation of other levels is also discussed.
$N^{14}(d,d')$	9	$d,d'_{3.95}(\theta)$	cyc, s	56G37	
$N^{14}(p,p')$	9.45	$p,p'_{3.9}(\theta)$	cyc, ppl	54F38	Approximately symmetric about θ(c.m.) = 90°; Legendre coefficients given.
$N^{14}(\alpha,\alpha')$	31.5	$\sigma(\alpha'_{2.31})$	cyc, scin	56W29	The cross section for the excitation of the T = 1 level at 2.31 Mev is < 6 per cent of that for the T = 0 level at 3.95 Mev.
$O^{16}(p,p')$	19	$p,p'(\theta)$	cyc, scin	55H70	Data for 9 excited states.
$F^{19}(d,d')$	8.90	$d,d'_{1.60}(\theta)$	cyc, s	56E09	Comparison with direct interaction theory indicates an angular momentum transfer of 2.
$Ne^{20}(d,d')$	7.8	$d,d'_{1.61}(\theta)$	cyc, ppl	52M46	Comparison with direct interaction theory indicates an angular momentum transfer of unity.
$Ne^{20}(p,p')$	9.51	$p,p'_{1.58}(\theta)$	cyc, ppl	54F37	Approximately symmetric about θ(c.m.) = 90°; Legendre coefficients given.
$Mg^{24}(p,p')$	7.3	$p,p'_{1.38}(\theta)$	cyc, scin	52G24	Asymmetric about θ(c.m.) = 90°; Legendre coeffs. given.
$Mg^{24}(p,p')$	8.86	$p,p'_{1.37}(\theta)$	cyc, pc	56G53	
$Mg^{24}(p,p')$	9.5 to 7.9	$p,p'_{1.37}(\theta)$	cyc, scin	57G45	Marked variation of angular distribution with energy.
$Mg^{24}(p,p')$	9.6	$p,p'_{1.38}(\theta)$	cyc, pc	52B86	Differential cross section decreases monotonically with increasing scattering angle.
$Mg^{24}(p,p')$	9.94	$p,p'_{1.38}(\theta)$	cyc, pc + range	54F39	Maxima near θ(c.m.) = 60° and 140°.
$Mg^{24}(p,p')$	18	$p,p'_{1.37}(\theta)$	cyc	56G16	The rough approximations of direct interaction theory are inadequate to explain the data.
$Mg^{24}(\alpha,\alpha')$	42	$\alpha,\alpha'_{1.37}(\theta)$	cyc	56G18	Agreement is found with direct interaction theory with an angular momentum transfer of 2.
$Al^{27}(d,d')$	9	$d,d'(\theta)$	cyc, s	56H40	Comparison with direct interaction theory is made for levels at 2.23, 2.75, and 3.04 Mev.
$Al^{27}(p,p')$	30.4	E(p') 1θ	cyc, ppl	50L68	Energy distribution varies approximately as $\exp(\alpha E^{1/2})$ with α = 3.0 to 3.6 for E(p') < 12 Mev.
$Al^{27}(p,p')$	31.5	E(p') 2θ's	lin, scin	52B89	

460722 O - 58 - 11

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
$S(p,p')$	96	$E(p')\ 1\theta$	cyc, scin	54S108	
$A^{40}(p,p')$	8.5 to 9.8	$p,p'_{1.47}(\theta)$	lin, scin	56E11	Backward scattering changes rapidly with E_p.
$A^{40}(p,p')$	9.51	$p,p'_{1.48}(\theta)$	cyc, ppl	54F37	Strong forward peak.
$Fe^{56}(p,p')$	17	$p,p'_{0.82}(\theta)$	cyc, scin	54S109	Direct interaction mechanism required; an angular momentum transfer of 2 is indicated.
$Pt(p,p')$	31.5	$E(p')\ 1\theta$	lin, scin	52B89	
$Pb(p,p')$	31.5	$E(p')\ 1\theta$	lin, scin	52B89	

II. RELATED DATA

II.A. ELASTIC SCATTERING

Reaction Type (Elements Studied)	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
(p,p) (Co, Ni, Cu, Zn)	5.25	$\sigma(\theta)/\sigma_R(\theta)$	cyc, ic	56B150	Only the data for Ni agree with a complex potential well calculation.
(p,p) (Be, C, F, Mg, Al, Ca, Mn, Ni, Cu, Zn)	5.4	$\sigma(\theta)/\sigma_R(\theta)$	lin, ppl	56K55	
(p,p) (Li, N, Al, A, Ni, Cu, Ag, Sn, Au)	9.8	$\sigma(\theta)/\sigma_R(\theta)$	lin, scin	57H56	Angles of successive maxima and minima of the diffraction patterns follow an $A^{-1/3}$ law. Optical-model fits given for A, Cu, Sn, Au.
(α,α) (Ag, Ta, Pb, Th)	13 to 42	$\sigma(E)\ 1\theta$	cyc, pc + range	54F40	Semiclassical strong-absorption model gives a best fit for the sum of the nuclear radius and the alpha-particle $D = (1.50A^{1/3} + 1.4) \times 10^{-13}$ cm.
(p,p) (Li^7, B, C, O, F, Mg, Al, P, Ti, Ni, Cu)	14.5	$p,p(\theta)$	lin, scin	56K54	The maxima and minima of the diffraction patterns occur approximately at the angles predicted by the elementary theory of diffraction. An interaction radius of $1.35A^{1/3} \times 10^{-13}$ cm is indicated. The behavior of the angular distributions for the light nuclei is irregular.
(Li^7, Be, B, C, N, O, F, Mg, Al, P, A, Ti, V, Ni, Zr)	20.0				
(Li^7, Be, B, C, N, O, F, Mg, Al, Si, P, S, Cl, A, V, Ti, Fe, Ni, Cu, Ga, Zr, Ag)	31.5				
(p,p) (Be, C, Al, Fe, Co, Ni, Cu, Zn, Rh, Ag, Pt, Au)	17.0	$p,p(\theta)$	cyc, scin	56D03	The location of the minima of the diffraction patterns follows a $(kR)^{-1}$ dependence.
(p,p) (Al, Fe, Ni, Cu, Ag, Sn, Pt)	18.3	$\sigma(\theta)$ 6θ's	cyc, scin	52G25	Data for Al in agreement with square-well, optical-model calculations of LeLevier and Saxon (52L29), but the agreement appears fortuitous (54W40). Data for Al and Pt also given for 15.5 Mev.
(p,p) (Al, Fe, Ni, Cu)	18.5	$p,p(\theta)$	cyc, scin	54D34	Optical-model calculations with square well disagree with experiment.
(p,p) (Al, Fe, Ni, Cu, Pd, Ag, Sn, Ta, Pt, Au, Pb)	18.6	$\sigma(79°)$	cyc, ppl	51B94	Measurements relative to W.
(p,p) (Al, Ni, Pd, W)	18.6	$\sigma(\theta)/\sigma_R(\theta)$	cyc, ppl	51B94	Data at 7 angles. Significant deviations from Rutherford scattering.

Reaction	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
(p,p) (Be, C, Mg, Al, Fe, Ni, Cu, Nb, Rh, Pd, Ba, Ta. W, Pt, Th)	21.5	$\sigma(\theta)/\sigma_R(\theta)$	cyc, Cu(p,n)	54C70	Diffraction maxima and minima observed, the angles for which follow a $(kR)^{-1}$ dependence.
(α,α) (Ag, Au, Pb)	22	$\sigma(\theta)/\sigma_R(\theta)$	cyc, scin	55W07	Comparison with sharp angular-momentum cut-off model gives for the sum of the nuclear radius and the alpha-particle radius $D = (1.5A^{1/3}+2.5) \times 10^{-13}$cm.
(α,α) (Li^6, C, Mg)	31.5	$\alpha,\alpha(\theta)$	cyc, scin	56W29	
(α,α) (C, Al, Ti, Cu, Nb, Mo, Ag)	40	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc + scin	56I02	The sum of the nuclear and alpha-particle radii is found to be $D = (aA^{1/3}+b) \times 10^{-13}$ cm, where $a = 1.27 \pm 0.07$ and $b = 1.60 \pm 0.23$.
(α,α) (Ta, Au, Pb, Th)	40	$\alpha,\alpha(\theta)$	cyc, scin	55W51	Qualitative features of the curves are satisfactorily explained by the theory of Ford and Wheeler.
(α,α) (Ag, Au, Pb)	48	$\sigma(\theta)/\sigma_R(\theta)$	cyc, pc	56E02	$D = (1.5A^{1/3}+1.2) \times 10^{-13}$ cm is found for the sum of the nuclear and alpha-particle radii.
(d,d) (Li, Be, C, Al, Cu)	94 to 157	d,d(θ)	cyc, scin	56B149	Deuteron polarizations measured.

II.B. INELASTIC SCATTERING

Reaction Type (Elements Studied)	Bombarding Energy	Quantity Measured	Method	Ref.	Remarks
(p,p′) ($Li^7_{4.61}$, $C^{12}_{4.43}$, $Mg^{24}_{1.37}$, $Si^{28}_{1.78}$)	12	p,p′(θ)	cyc, pc	57C53	Data is also given for C^{12} at 10 Mev. Comparison with direct interaction theory is made.
(d,d′) ($Li^6_{2.19}$, $Li^7_{4.61}$, $Be^9_{2.43}$, $C^{12}_{4.43}$, $Mg^{24}_{1.37}$, $Al^{27}_{2.23,2.75}$)	15	d,d′(θ)	cyc, scin	56H55	Comparison with direct interaction and electric excitation theory is made.
(p,p′) (Al, Fe, Ni, Cu, Ag, Sn, Pt)	18.3	E(p′) 2θ's	cyc, scin	54G67	Level densities and nuclear temperatures given.
(p,p′) (24 elements with $27 \leq Z \leq 92$)	23	E(p′) 1θ	cyc, scin	57C56	Strong, monoenergetic inelastic groups are observed. Angular distributions of the inelastic groups from Ni, Zn, Zr, Ag, and Sn are also given.
(p,p′) (Pt, Au, $Pb^{206,207,208}$, Bi^{209}, Th)	23	E(p′) 1θ	cyc, scin	57C58	Strong, monoenergetic inelastic groups are observed. Data for Bi^{209} also given for four other angles.
(p,p′) (Sn, Ta, Au, Pb)	31	E(p′) 5θ's	lin, pc + scin	54E30	A direct interaction model appears necessary to explain the forward maxima.
(α,α') ($Li^6_{2.19,4.5}$, $C^{12}_{4.43,7.65}$, $Mg^{24}_{1.37,4.12}$)	31.5	$\alpha,\alpha'(\theta)$	cyc, scin	56W29	Comparison is made with direct interaction theory.
(α,α') (Al, V, Cu, Nb, Ag, Ta, Th)	40.2	E(α') 5θ's	cyc, pc + scin	57I01	Direct interaction dominates at forward angles, compound nucleus formation at backward angles.
(p,p′) (Li, Be, B, C, N. O, F, Mg, Al, Si, P, S, Cu, Ag, Pb, Bi)	96	E(p′) 1θ	cyc, scin	56S130	Fits to the continua of the form $a_A E exp(-E/b_A)$ are made; graphs of a_A and b_A as function of A are given.

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	J	μ	q	Method	Ref.
Sm^{152}	(0.122 level)				
		|0.72 1|		pγ(θ,H)	57S16
Eu^{154}	3	$\|\mu^{154}/\mu^{153}\|$ = 1.308 4		para	56K35
Gd^{155}	3/2	|0.24 4|		para	56L29
Gd^{157}	3/2	|0.32 5|		para	56L29
Yb^{173}			+2.4	S	56K42
Lu^{175}			+3.6 2	S	57M96
Ta^{181}	(0.482 level)				
	5/2	+3.25 17	γγ(θ), γγ(θ,H)		56D43
Ta^{181}			+2.7 3	S	57M96
Os^{189}			0.60 14	S	57M96
Tl^{198}	(1.9^h level)				
	7			M	56B113
Tl^{199}	1/2			M	56B113
Tl^{204}	2	|0.0894 20|		M	57B122
	2	|0.062 6|		M	56B124
Po^{212}	≠0		βα(θ)	ppl	56B138
U^{235}			(−?) 3.8	para	56B129

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